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WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MISCELLANY
ISSUED FOR THE INFORMATION OF COOPERATORS
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Chicago, Ill. No. 41 November, 1944

Classification: Acarina, Argasidae

Cooley, R. A., and Glen M. Kohls. The Argasidae of North America, Central America, and Cuba, American Midland Naturalist (Notre Dame, Ind.), Monograph No. 1, 152 pp., 14 pls., 57 figs., 1944.

Introductory remarks deal with history of knowledge of the group, and with its medical and veterinary importance. Technical terms used in the work are explained, methods of study described, and a systematic account of the family presented, which includes keys to genera and species, synonymy, descriptions of all stages, illustrations, statements of distribution, and range maps. Hosts and economic effects are discussed and a classified list of hosts presented. There is also a catalog of the species according to the countries from which so far known, a five-page bibliography, and an index. A model taxonomic paper.

Classification: Chipmunks (Eutamias)

Johnson, David H. Systematic review of the chipmunks (Genus Eutamias) of California, Univ. of California Publ. in Zoology (University of California Press, Berkeley. $1.00 a copy), 48(2), pp. 63-146, pl. 6, 12 figs., 6 tables, 1943.

The history of knowledge of the group is traced and its general characters are discussed. Geographic distribution, variation, and ecologic status are treated and keys to 10 species and their subspecies are presented. For each of these forms known to occur in the State, there is an account giving: synonymy, data on type, notes on range, habitat and characters, comparative notes, measurements, and a list of specimens that were examined. There is an account of a single miocene species and a 3-1/2 page bibliography.

Conservation

Committee. Hearings before the Select Committee on Conservation of Wildlife Resources, House of representatives, Seventy-eighth Congress, First Session, December 9 and 10, 1943 (U. S. Government Printing Office, Washington, D. C.), 319 pp., maps, tables.

Annual account of the activities of Federal agencies concerned in wildlife conservation: the Fish and Wildlife, Forest, National Park, and Soil Conservation, Services. As usual the matters included are formal statements and records of questions and answers about the various lines of work. The report contains many things not readily accessible elsewhere as: Estimate of the numbers of big game mammals in national parks and monuments, 1942 (p. 5), poundage of game taken in the United States, 1942 (p. 27), maps of the ranges of certain game mammals and birds with indication of the areas where economic damage is done (pp. 30-34), wildlife possibilities of the Tennessee Valley (pp. 152-157), increase of big-game populations on the national forests 1921-1942 (p. 205), big-game inventory 1940, according to land ownership and control (p. 212), estimate of big game on the national forests, 1942 (pp. 213-222), of fur animals to correspond (pp. 225-242), of predators (pp. 243-247),

of game birds (pp. 249-257), and recreational and economic values of wildlife on the national forests (pp. 262-264).

Conservation

Committee. Report on the progress of wildlife restoration and management, etc., Seventy-eighth Congress, Second Session, Senate Report No. --, 111 pp., 45 tables.

Introductory pages list the lines of investigation undertaken by the Senate Special Committee, discuss Federal legislation affecting wildlife and such topics as the value of wildlife, farmer-sportsman relationships, who owns wildlife?, the need of a wildlife extension service, and waterfowl problems. The bulk of the report consists of statistical tables among which the following may be mentioned: Summary of Federal aid to the states in wildlife restoration, number of hunting licenses and receipts therefrom, migratory bird hunting stamp sales, 1934-1943, national wildlife refuges, predators taken in the course of Federal-cooperative control work, 1916-1943, game taken in the United States, 1942, estimate of game birds, big game, fur animals, and predators on national forests, 1942, acreage of Federal real estate, and area of public lands in Federal ownership.

Conservation: Hawks

Abbott, Jacob B. Hawks in flight, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 15(4), July 1944, pp. 5, 26-27, 30, 32, illus.

Besides useful drawings, diagrams, and descriptions of hawks in flight, this article embodies pleas for rational treatment of hawks by the author and by C. H. Manley.

Control: Aquatic plants

Clark, Clarence F. Lotus and cattail control, Ohio Conservation Bulletin (Division of Conservation and Natural Resources, 1106 State Office Bldg., Columbus 15, Ohio. 10 cents a copy), 8(8), Aug. 1944, pp. 18-19, 4 photos.

By repeated cutting with an aquatic mowing machine.

Control: By Army engineers

Reed, J. D. Insect and rodent control in the Corps of Engineers, Journ. Economic Entomology (E. N. Cory, College Park, Md. 75 cents a copy), 37(3), June 1944, pp. 333-335.

Army Regulations are quoted as to the responsibilities of the Medical Corps and of the Corps of Engineers in the control of rodents, vermin, and disease-bearing insects. The organization of the work, personnel, and cooperation among Government agencies are discussed.

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Control: Deer damage

Gower, Carl. Antlerless season controls deer damage, Michigan Conservation (Michigan Dept. of Conservation, State Office Bldg., Lansing), 13(7), Aug. 1944, pp. 3, 11, 1 map.

To control damage to celery and other crops, a special season has been open in Allegan County since 1942. In three years 134 deer were taken and damage complaints have almost stopped.

Control: Mouse

Garlough, F. E., and Donald A. Spencer. Control of destructive mice, U. S. Dept. of the Interior Conservation Bul. 36 (Washington, D. C.), 37 pp., 27 figs., 1944.

Relates to meadow, pine, white-footed, pocket, and house mice, and gives as applicable recommendations for cultural control, preventive measures, trapping, and poisoning. Natural enemies of the various groups are discussed. Bibliography of 21 titles.

Control: Snake-bite

Netting, M. Graham. Poisonous snakes--a minor hazard to soldiers, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg, 10 cents a copy), 15(5), Aug. 1944, pp. 6-7, 21, 5 photos.

The article points out that poisonous snakes are only a minor menace in most parts of the world, suggests means of avoiding snake-bite, and outlines field treatment of bites.

Cycles: Arctic animals

Chitty, Helen. Canadian arctic wild life enquiry, 1941-42, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, N.W. 1, London, England. 20 shillings a copy), 12(2), Nov. 1943, pp. 163-172, 4 maps, 3 tables.

Seventh in a series of annual reports on an enquiry by questionary as to population changes in lemmings, arctic fox, and snowy owl, and as to disease among sledge dogs. From the author's summary: "Arctic foxes were increasing or abundant almost everywhere throughout the Arctic and Subarctic except for the west coast of Hudson Bay where they had crashed after a peak year in 1940-41. 1941-42 was the first year of recovery in arctic fox on the Northern Labrador coast, and around James Bay and the south part of Hudson Bay; for northern Quebec and Baffin Island it was the second year and also for Victoria Island (where lemmings and snowy owls were still increasing); while for Repulse Bay and Southampton Island it was the third year of increase. Lemmings had mostly decreased in northern Quebec and the far north of Baffin Island although they were still abundant farther south in Baffin Island. They had crashed on the west coast of Hudson Bay along with foxes and snowy owls.

'lice' were more abundant along the Northern Labrador coast and around the southern part of Hudson Bay and James Bay. Snowy owls had disappeared from much of the Eastern Arctic, except for some of the places, particularly Northern Labrador, where there were still numbers of lemmings or 'mice'. There had been a flight into Southern Canada and the United States in the autumn of 1941. Sledge dogs were generally free from epidemics although an outbreak of 'distemper' was reported in north-eastern Manitoba and north-western Ontario."

Cycles: Hare, Snowshoe

Chitty, Helen. The snowshoe rabbit enquiry, 1941-42, Canadian Field-Naturalist (I. L. Conners, Central Experimental Farm, Ottawa, Canada. 40 cents a copy), 57(7-8), Oct.-Nov. 1943, pp. 136-141, 2 figs., 2 tables.

Eleventh in a series that has previously been drawn to attention in WILDLIFE REVIEW. The summary of this installment is: "Six hundred and ten observers in Canada, the United States and Alaska reported on the density of the snowshoe rabbit, Lepus americanus, in 1941-42 compared with the previous year. The long-term cycle in numbers was at different stages; in Alaska rabbits were just beginning to come back, in the prairie provinces they were approaching their peak of abundance, and in Nova Scotia they were passing it. In other parts of Canada and in the United States from Minnesota east, numbers were mostly increasing through various levels of abundance."

Destruction: Highway mortality

Haugen, Arnold C. Highway mortality of wildlife in southern Michigan, Journ. Mammalogy (Ernest T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(2), May 1944, pp. 177-184, 3 tables.

The occurrence of cottontails, fox squirrels, pheasants, bobwhites, muskrats, opossums, skunks, and raccoons in the highway kill is tabulated and discussed. The effects of highway mortality on animal populations is considered. Author's summary: "(1) The greatest highway mortality of cottontails, fox squirrels, muskrats, opossums, skunks and raccoons is associated with increased activity that occurs during the breeding season and periods of dispersal; (2) the definite early spring increase in highway mortality of cottontails results to a large extent from an increase in kill of males; (3) the ultimate effect of highway mortality of small game in southern Michigan, especially cottontails, is insignificant in consideration of the total population susceptible to hazards of highway traffic." Bibliography of 9 titles.

Diseases and Parasites: Bird pox

Syverton, Jerome T., and Ian McTaggart Cowan. Bird pox in the sooty grouse, Dendragapus fuliginosus fuliginosus, with recovery of the virus, Amer. Journ. Veterinary Research (600 S. Michigan Ave., Chicago, Ill. $1.25 a copy), 5(16), July 1944, pp. 215-222, 5 pls.

Author's summary: "The virus of fowl pox (contagious epithelioma of fowl) was the causal agent of a naturally occurring infectious disease of sooty grouse (Dendragapus fuliginosus fuliginosus) in the Cowichan Valley of southeastern Vancouver Island, British Columbia. The affected tissues of the diseased grouse readily yielded a virus that is indistinguishable from a known strain of fowl pox in its pathogenic, histopathologic, and morphologic characteristics. Moreover, chickens recovered from an infection with the causative agent of the grouse disease are solidly immune to attempted infection with a massive dose of fowl-pox virus. This is the first time that the sooty grouse has been implicated as a natural host for the virus disease, fowl pox." Bibliography of 9 titles.

Diseases and Parasites: Blood parasites

Herman, Carlton M. The blood protozoa of North American birds, Bird-Banding (Charles B. Floyd, 210 South St., Boston, Mass. 75 cents a copy), 15(3), July 1944, pp. 89-112.

History of the study of these forms; list of hosts by parasites and the reverse, with references to the literature, 103 titles of which are cited.

Diseases and Parasites: Chagas's disease

Wood, Sherwin F. An additional California locality for Trypanosoma cruzi Chagas in the western cone-nosed bug, Triatoma protracta (Uhler), Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 30(3), June 1944, p. 199.

Mammalian host: Neotoma fuscipes macrotis.

Diseases and Parasites: Chagas's disease

Wood, Sherwin F. The reptile associates of wood rats and cone-nosed bugs, Bul. Southern California Acad. Sci. (Los Angeles County Museum, Exposition Park, Los Angeles 7, Calif.), 43(1), 1944, pp. 44-48.

In the search for vectors of Chagas's disease or American human trypanosomiasis in the southwestern United States, sixteen species of snakes and lizards were found in the houses of wood rats. Cone-nosed bugs were present in dens harboring 6 of the reptilian species.

Diseases and Parasites: Muscular dystrophy

Jungherr, Erwin, Rebecca Gifford, and A. L. Lamson. Inapparent muscular dystrophy in young ring-necked pheasants, Journ. Wildlife Management (F. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 261-262, 1 pl., 1 table.

Connecticut. Description and illustration of lesions and discussion of the abnormality and its effects. Authors conclusions: "The cause of this muscular dystrophy is unknown. The lesions suggested a non-microbial degenerative condition resembling that reported in ducks and in small laboratory

mammals fed a diet low in vitamin E. No correlation was apparent between the incidence of muscular dystrophy and type of feed since seven of eight commercial brands were used in flocks having positive cases. That the microscopic lesions were relatively mild and that voluntary muscles are endowed with high regenerative power may explain the lack of clinical symptoms. It is inconceivable, however, that the widespread pathologic changes observed in the muscles should not influence adversely the faculties of sustained mobility and coordination. Extended clinical tests and feeding experiments with rations low in vitamin E should be made." Bibliography of 5 titles.

Diseases and Parasites: Panophthalmitis

Rosenfeld, Irene, and C. A. Heath. Contagious panophthalmitis in deer, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 247-250, 1 pl.

Literature of injury and other pathology of the eyes of deer is reviewed (5 titles cited) and the authors' findings both in the field (Medicine Bow National Forest) and in the laboratory are recounted. Histopathology is described and illustrated. Authors' summary: "Infection causing panophthalmitis in male mule deer in Wyoming during 1943 was studied grossly and microscopically. The disease processes were not self-limiting but progressive in nature and resulted in blindness. The causative agent is suspected of being a virus. No direct evidence is available, but the failure to demonstrate any organisms in the deeper layers of the eye suggests a virus infection. Gross and microscopic studies of the viscera revealed no pathologic changes. The brain and pituitary showed moderate edema and congestion, indicating that the infective agent had direct affinity for the infected organ."

Diseases and Parasites: Plague

Anon. Plague infection reported in the United States during 1943, Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 59(28), July 14, 1944, pp. 911-915, 1 table.

In humans there were two cases, 1 fatal, in Siskiyou County, California. The tabulation records 91 identifications of the disease in rodents and their ectoparasites in 7 western states.

Diseases and Parasites: Plague

Brown, John H. Sylvatic plague; A note on the finding of large numbers of fleas on ground squirrels (gophers) in Alberta, Bul. Brooklyn Ent. Soc. (311 East 4th St., Tucson, Ariz. 75 cents a copy), 39(3), June 1944, pp. 80-82.

Numbers of fleas found on Richardson's and Columbia ground squirrels in relation to the prevalence of plague in these animals..

A very similar paper by the same author is in the Journ. Ent. and Zool. (Claremont, Calif.), 36(3), Sept. 1944, pp. 70-71.

Diseases and Parasites: Plague

Hundley, James H., and Kaarlo M. Nasi. Anti-plague measures in Tacoma, Washington, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 59(38), Sept. 22, 1944, pp. 1239-1255, 4 figs., 2 tables.

Ectoparasites of rats trapped in Tacoma in October 1942 were found to be carrying the plague bacillus (Pasteurella pestis). A campaign to minimize the danger was immediately undertaken. Several methods of eliminating rats were put into effect and on May 4, 1943 the last specimen yielding a positive diagnosis of the disease was found. "Since then more than 8,000 rodents and their ectoparasites have been examined without detecting the presence of plague. It seems reasonable to conclude that the infection has been brought under complete control and that plague has been eradicated."

Diseases and Parasites: Snake vector

Hinshaw, W. R., and E. McNeil. Gopher snakes as carriers of salmonellosis and paracolon infections, Cornell Veterinarian (F. P. Levine, Ithaca, N. Y. 75 cents a copy), 34(3), July 1944, pp. 240-254.

Pituophis catenifer deserticola; California. Review of literature (5 titles cited) on reptiles as carriers of pathogenic organisms. This report is upon a single snake, in which were found two Salmonella and one paracolon bacteria identical with those infesting poultry on the ranch where it was captured.

Diseases and Parasites: Typhus

Beck, M. Dorthy, Howard L. Bodily, and Rosemary C'Donnell. A strain of typhus rickettsiae isolated from the brain of a wild rat in California, Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 59(22), June 2, 1944, pp. 701-712, 4 figs., 2 tables.

Brief history of typhus infection in the State and report on studies of that in the animal mentioned. Authors' summary: "For the first time in California a strain of typhus rickettsiae has been isolated from the brain of a wild rat (R. rattus alexandrinus) associated with the place of employment of a laboratory diagnosed case of typhus fever. Strain 825 fulfills the six criteria for the identification of endemic strains of typhus fever. Typhus fever of the murine type was found to be present in the county surveyed. Bibliography of 24 titles.

Diseases and Parasites: Visceral gout

Cowan, I. McT., and C. D. Fowle. Visceral gout in a wild ruffed grouse, Journ. Wildlife Management (F. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 260-261, 1 pl.

Description and illustration of the lesions; notes on visceral gout in poultry. British Columbia.

Diseases and Parasites: Western duck sickness

Lakin, H. W., E. R. Quortrup, and Neil Hotchkiss. The relation of selenium to western duck sickness, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 61(3), July 1944, pp. 415-420.

As a result of field studies and of laboratory analyses of bird carcasses and mud and water samples, it is concluded that selenium does not appear to be a factor in western duck sickness. Bibliography of 14 titles.

Diseases and Parasites: Acarina, Amblyomma

Cooley, R. A., and Glen M. Kohls. The genus Amblyomma (Ixodidae) in the United States, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 30(2), April 1944, pp. 77-111, 12 figs., tables.

History of the genus, account of its medical and veterinary importance in the United States; definition of terms used in descriptions; key to females, males, and nymphs of 6 species. For each of these, synonymy, descriptions of all stages, illustrations, notes on distribution and hosts, and records of specimens in the Rocky Mountain Laboratory of the National Institute of Health are given. Two-page bibliography. A valuable summary.

Diseases and Parasites: Acarina, Halarchne

Doetschman, Willis H. A new species of endoparasitic mite of the family Halarachnidae (Acarina), Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan), 63(1), Jan. 1944, pp. 68-72, 1 pl.

From the California sea lion; description, measurements, illustrations, comparative notes, affinities. Bibliography of 11 titles.

Diseases and Parasites: Acarina, Ixodes

Smith, Carroll N. Biology of Ixodes muris Bishopp and Smith (Ixodidae), Annals Ent. Soc. America (Clarence M. Kennedy, Ohio State University, Columbus. $1.25 a copy), 37(2), June 1944, pp. 221-234, 10 tables.

Nine mammal hosts are named, of which the meadow mouse is said to be most important. Known distribution includes Massachusetts and New Hampshire. Life history is treated in detail.

Diseases and Parasites: Anoplura

Doetschman, Willis H. Notes on anoplura infesting marine carnivores, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 30(3), June 1944, p. 200.

Antarctophthirus microchir from the California sea-lion, Steller's sea-lion, and the harbor seal.

Diseases and Parasites: Cestoda, Diorchis

Jones, Arthur W. Diorchis reynoldsi n. sp., a hymenolepidid cestode from the shrew, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan), 63(1), Jan. 1944, pp. 46-49, 1 pl., 1 table.

From Blarina brevicauda, Virginia; description, illustration, comparative notes.

Diseases and Parasites: Cestoda, Diorchis

Jones, Arthur W. Diorchis ralli n. sp., a hymenolepidid cestode from the king rail, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan), 63(1), Jan. 1944, pp. 50-53, 1 pl.

Virginia. Description, measurements, illustrations; comparative notes involving 11 species. Bibliography of 15 titles.

Diseases and Parasites: Cestoda, Mesocestoides

Chandler, Asa C. A new species of Mesocestoides, M. kirbyi, from Canis latrans, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 30(4), Aug. 1944, p. 273, 2 figs.

California. Description, measurements, illustrations; comparative notes.

Diseases and Parasites: Cestoda, Cochoristica

Stunkard, Horace W., and Lillian F. Lynch. A new anoplocephaline cestode, Cochoristica anniellae, from the California limbless lizard, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan), 63(2), April 1944, pp. 165-169, 1 pl.

From Anniella pulchra nigra; original description, measurements, illustrations, comparative notes. Bibliography of 6 titles.

Diseases and Parasites: Cestoda, Raillietina

Webster, Jackson D. A new cestode from the bob-white, Trans. Amer. Microscopical Society (James E. Ackert, Kansas State College, Manhattan), 63(1), Jan. 1944, pp. 44-45, 1 pl.

Raillietina colinia n. sp.; diagnosis, measurements, illustrations, comparative notes; Texas.

Diseases and Parasites: Diptera, Protocalliphora

Mason, Edwin A. Parasitism by Protocalliphora and management of cavity-nesting birds, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 232-247, 3 figs., 2 tables.

This is a report upon the most protracted and thorough study yet made of the relation of these nestling parasites to birds and of the possibilities of controlling their infestations; locality Massachusetts. Literature of the subject (19 titles cited) is reviewed and the methods used in the investigation are described. Separate accounts are given of parasitization and its effects upon the broods of the tree swallow, bluebird, house wren, barn swallow, robin, starling, and song sparrow. The life equation of the Protocalliphora is discussed and a table given indicating mortality from parasites, predators, and unknown causes. The life history of the fly also is set forth. Experiments revealed the inefficiency of repellents in controlling infestations. Control by management is considered and suggestions are made. "The best x x x is to delay the cleaning of nest cavities until spring or early summer, to safeguard brood stock of the secondary parasite."

Diseases and Parasites: Diptera, Stilbometopa

Herman, Carlton M. Notes on the pupal development of Stilbometopa impressa (Diptera: Hippoboscidae), Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 30(2), April 1944, pp. 112-118, 1 table.

Review of information on the biology of hippoboscids, and report on the author's studies of this parasite of the valley quail (Lophortyx californica vallicola). Bibliography of 12 titles.

Diseases and Parasites: Hemiptera, Triatoma

Wood, Sherwin F. Notes on the feeding of cone-nosed bugs (Hemiptera, Reduviidae), Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 30(3), June 1944, pp. 197-198.

Notes on the nymphs feeding on several species of lizards and snakes in Arizona and California.

Diseases and Parasites: Mallophaga

Brown, J. H., and A. L. Milk. Mallophaga of Alberta: a list of species with hosts, Canadian Entomologist (R. W. Thompson, Ontario Agricultural College, Guelph, Canada), 76(6), June 1944, pp. 127-129.

The title is sufficient abstract. Thirty-eight species of mallophagans from 34 host groups (chiefly birds) are listed. Directions for clearing, fixing, and mounting specimens are given.

Diseases and Parasites: Nematoda, Diplotriaena

Seibert, Henri C. Notes on the genus Diplotriaena with the description of a new species, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan), 63(3), July 1944, pp. 244-253, 1 pl., 2 tables.

D. thomasi n. sp. from white-throated sparrows, Illinois; description, measurements, illustrations, comparative notes. Provisional key to species from the literature, 18 titles of which are cited.

Diseases and Parasites: Nematoda, Protostrongylus

Goble, Frans C., and E. L. Cheatum. Notes on the lungworms of North American Leporidae, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 30(2), April 1944, pp. 119-120.

Report on occurrence of Protostrongylus boughtoni in snowshoe hares and cottontails in New York and discussion of records of other lungworms in American Leporidae. Bibliography of 5 titles.

Diseases and Parasites: Nematoda, Protostrongylus

Scott, John W. A new lungworm from the Leporidae, Protostrongylus sylvilagi, n. sp., Univ. of Wyoming Publ. (Laramie), 10(6), pp. 57-71, 2 pls., July 1943.

A destructive epizootic in Wyoming affected both cottontails and jack rabbits. The parasite is described as new, illustrated, and its life history indicated. A provisional key to 15 species of Protostrongylus is presented. Bibliography of 20 titles.

Diseases and Parasites: Protozoa, Eutrichomastix

Morgan, Banner B. Parasite-host list of the genus Eutrichomastix (Protozoa: Flagellata), Proc. Helminthological Society of Washington (Edna M. Buhrer, Plant Industry Station, Beltsville, Md. 25 cents a copy), 11(2), July 1944, pp. 58-60.

The genus is widely distributed in the animal kingdom, 20 known species being recorded as infesting animals of 2 phyla, 7 classes, 22 orders, and 40 families, including a variety of vertebrates.

Diseases and Parasites: Protozoa, Sarcosporidia

Ball, Gordon H. Sarcosporidia in southern California lizards, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan), 63(2), April 1944, pp. 144-148, 1 pl.

Discussion of the occurrence of Sarcosporidia in reptiles and of their characters; description and illustration of two new subspecies: Sarcocystis lacertae utae and S. platydactyli scelopori; comparative notes. Bibliography of 7 titles.

Diseases and Parasites: Protozoa, Selenomonas

Chattin, John E., and Carlton M. Herman. A parasite from antelope in California, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan), 63(1), Jan. 1944, pp. 27-29, 1 pl.

A flagellate (Selenomonas ruminantium); the first report of this organism from American ruminants and the first record of it in the blood of animals outside of Africa.

Diseases and Parasites: Siphonaptera

Brown, John H. The fleas (Siphonaptera) of Alberta, with a list of the known vectors of sylvatic plague, Annals Ent. Soc. America (Clarence H. Kennedy, Ohio State University, Columbus. $1.25 a copy), 37(2), June 1944, pp. 207-213.

List of 53 species with brief synonymy and host and locality records. Eleven species are listed with similar data as known plague vectors, and 17 hosts (all mammals except for the burrowing owl) from which plague-carrying fleas have been collected are enumerated. Bibliography of 6 titles.

Diseases and Parasites: Siphonaptera, Thrassis

Augustson, Gustaf F. The flea genus Thrassis and sylvatic plague, with the description of T. brennani n. sp., Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 30(4), Aug. 1944, pp. 237-240, 3 figs.

List of the species and their hosts; description and illustrations of the new species from Citellus tridecimlineatus, Texas.

Diseases and Parasites: Trematoda, Collyriclum

Farner, D. S., and B. B. Morgan. Occurrence and distribution of the trematode, Collyriclum faba (Bremser) in birds, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 61(3), July 1944, pp. 421-426.

Review of the progress of knowledge of this parasite, discussion of its range and probable intermediate hosts, notes on infections in American birds, and host list, representing 34 genera and 26 species of birds. Bibliography of 29 titles.

Diseases and Parasites: Trematoda, Eurytrema

Denton, J. Fred. The occurrence of Eurytrema allentoshi (Foster, 1939) in the opossum in Texas, Proc. Helminthological Soc. of Washington (Edna M. Buhrer, Plant Industry Station, Beltsville, Md. 25 cents a copy), 11(2), July 1944, pp. 54-55, fig. 1.

Description, illustration. Platynosomum is regarded as a synonym of Eurytrema.

Diseases and Parasites: Trematoda, Glypthelmins

Rankin, John S., Jr. A review of the trematode genus Glypthelmins Stafford, 1905, with an account of the life cycle of G. quieta (Stafford, 1900) Stafford, 1905, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan), 63(1), Jan. 1944, pp. 30-43, 2 pls.

Historical review of these parasites of amphibians; description and illustration of the stages, and discussion. Four species, considered valid, are defined. "The study of large numbers of specimens to determine validity of specific characters, and knowledge of life cycles to show relationships clearly, is urged." Bibliography of 37 titles.

Diseases and Parasites: Trematoda, Halipegus

Rankin, John S., Jr. A review of the trematode genus Halipegus Looss, 1899, with an account of the life history of H. amherstensis n. sp., Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan), 63(2), April 1944, pp. 149-164, 2 pls.

From frogs (Rana spp.). Historical account of the genus, description, illustrations, measurements of the stages of H. amherstensis n. sp. (Massachusetts); experimental demonstration of the life cycle; taxonomy of 12 species of the genus; revised description of Halipegus; discussion of relationships. Bibliography of 44 titles.

Diseases and Parasites: Trematoda, Metorchis

Cameron, Thomas W. M. The morphology, taxonomy, and life history of Metorchis conjunctus (Cobbold, 1860), Canadian Journ. Research (National Research Council, Ottawa, Canada), Vol. 2, Sec. D, No. 1, Feb. 1944, pp. 6-16, 13 figs.

Occurs in man and other fish-eating mammals; review of literature (20 titles cited), morphology, taxonomy, comparative notes, distribution, life history.

Diseases and Parasites: Of beaver

Erickson, Arnold B. Parasites of beavers, with a note on Paramphistomum castori Kofoid and Park, 1937, a synonym of Stichorchis subtriquetrus, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 31(3), May 1944, pp. 625-630.

Six species of helminths recorded from American beavers are listed and the papers relating to them are abstracted. During autopsies of 140 animals from Minnesota, four kinds of helminths were found of which two had a high degree of incidence, namely, a stomach worm, Travassosius americanus (88.57%), and a cecal fluke, Stictiorchis subtriquetrus (78.57%). Of external parasites, two beetles, a biting louse, one tick, one mite, and larvae of the screw-worm fly are mentioned. Bibliography of 20 titles.

Diseases and Parasites: Of birds

Morgan, Banner B. Bird mortality, The Passenger Pigeon (N. R. Barger, 4333 Hillcrest Drive, Madison 5, Misc.), 6(2), April 1944, pp. 27-34, 3 photos.

Popular account of the maladies of birds caused by bacteria, viruses, and internal and external parasites, and of mortality due to lead poisoning, botulism, malnutrition, and accidents. Suggestions are made as to the use of birds in research in relation to their own and to human diseases. "In reviewing his aims the writer believes that he has summarized the information available on the diseases of birds, that he has made logical speculations in ascertaining what might cause their mortality, and that he has emphasized the gaps in our knowledge of the maladies that afflict birds. He has also appealed to the need for ornithologists and disease experts to collaborate in gathering, constructing and publishing data which will contribute to the why's of the losses of our wild birds."

Diseases and Parasites: Of cottontail

Smith, R. H., and E. L. Cheatum. Role of ticks in decline of an insular cottontail population, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(4), Oct. 1944, pp. 311-317.

Authors' summary: "Fishers Island, New York, was stocked with several dozen midwestern cottontails about 1925; in the absence of ground predators, overpopulation resulted and there was serious damage by 1938. Attempts at control by bounties and by shooting were unsuccessful. Following moderate reduction by winter starvation in 1940-41, a considerable mortality accompanied by tick infestation was reported in 1942. Investigation in May 1943 showed a substantial mortality through parasitization of adult rabbits by Ixodes dentatus and, to a lesser degree, by Haemaphysalis leporis-palustris. Apparently death was caused by (1) tick-induced anemia; or (2) bacterial infections at points of tick attachment which resulted in localized or metastatic pyogenic infections of the lymph nodes. Juvenile losses occurred (1) when nestlings were abandoned by sick or dying female rabbits, or (2) when burdened with fatal infestations of ticks after leaving the nest. The local pheasants were parasitized by ticks but not killed thereby, so far as is known. One muskrat, two grey squirrels and a ground squirrel were free of ticks when examined." Bibliography of 10 titles.

Diseases and Parasites: Of deer

Olsen, O. Milford, and R. Fenstermacher. The helminths of North American deer with special reference to those of the white-tailed deer (Odocoileus virginianus borealis) in Minnesota, University of Minnesota Agr. Expt. Sta. (St. Paul), Tech. Bul. 159, 30 pp., 2 pls., 4 tables, 1945.

A comprehensive illustrated bulletin with a key to known helminth parasites of all North American deer. Authors' summary: "(1) The parasitological findings from 95 deer originating from Northern Minnesota are presented; (2) ten species of parasites, four arthropods and six helminths, were found; (3) the biting and sucking lice were most common in the crowded deer yards; (4) the young deer of the yearling class were parasitized almost exclusively by ectoparasites. The adult deer harbored both the ecto- and endoparasites; (5) the sucking lice appeared to be limited to the young deer; (6) the winter tick

was common but not abundant; (7) the two most common helminths found were the liver flukes, Fascioloides magna, and the larval tapeworm, Cysticercus tenuicollis = Taenia hydatigena; all others were rare; (8) a key for the identification of the adult helminths reported for North American deer and a table for the identification of their eggs or larvae occurring in the feces of the deer are included." Bibliography of 10 titles.

Diseases and Parasites: Of eelgrass

Addy, C. E., and David A. Aylward. Status of eelgrass in Massachusetts during 1943, Journ. Wildlife Management (F. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(4), Oct. 1944, pp. 269-275, 1 pl., 1 fig. (map).

Discussion of the eelgrass depletion of 1931-32, and its causes and effects. Report upon the status of the plant in 1943, which although improved, was not secure as disease was still seriously prevalent. Local betterments in eelgrass ecology are outlined and transplanting experiments are reported upon. Bibliography of 5 titles.

Diseases and Parasites: Of fox, gray

Buechner, Helmut Karl. Helminth parasites of the gray fox, Journ. Mammalogy (Ernest T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(2), May 1944, pp. 185-188, 1 table.

Urocyon cinereoargenteus texensis. The parasites found are named and briefly annotated. Author's summary: "Examination of 80 preserved viscera and 32 additional stomachs of the gray fox revealed 10 kinds of helminth parasites, five of which, namely, Taenia pisiformis, Ancylostoma caninum, A. braziliense, Physaloptera rara, and Pachysentis canicola, are apparently of pathological importance. No parasites were found in any of the internal organs other than the stomach, intestines, and trachea. The occurrence of the acanthocephala, Pachysentis canicola, in North America is here reported for the first time."

Diseases and Parasites: Of grouse, sage

Simon, Felix. The parasites of the sage grouse Centrocercus urophasianus, Univ. of Wyoming Publ. (Laramie), 7(5), pp. 77-100, 16 figs., May 1940.

Protozoa (3), Cestoda (2), Nematoda (3), Mallophaga (2), and Acarina (2); described and illustrated. There is brief comment on the pathogenicity of these forms. Bibliography of 17 titles.

Diseases and Parasites: Of swallow, cliff

Baerg, W. J. Ticks and other parasites attacking northern cliff swallows, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 61(3), July 1944, pp. 413-414, 1 pl.

White River, Arkansas. Notes on infestation by Ixodes baergi (tick), Cleiacus vicarius (bedbug ally), Ceratophyllus celsus (flea), and Myrsidea dissimilis (bird louse).

Ecology: Browse survey

Aldous, Shaler E. A deer browse survey method, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(2), May 1944, pp. 130-136, 3 tables.

By percentage sample surveys of the availability and the degree of utilization of browse. Tally sheets used in the work are illustrated and their tabulation and other methods of the surveys are discussed. The tables show the results obtained for three deer yards of different characteristics. The method is a simple one for determining whether an area is overstocked, properly stocked, or understocked.

Ecology: Census methods

Bach, Roy M. The sportsman versus upland game populations, North Dakota Outdoors (State Fish and Game Department, Bismarck. 5 cents a copy), 7(1), July 1944, pp. 11-12, 1 chart.

Despite the title, this is merely an account of a method of counting game birds from an automobile, with reproduction of a sheet used in recording the results.

Ecology: Cruising radius, muskrat

Takos, Michael J. Summer movements of banded muskrats, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(4), Oct. 1944, pp. 307-311, 1 fig., 2 tables.

Author's summary: "Movements of tagged wild muskrats in Corinna Stream, Maine, were studied by recapturing individuals at frequent intervals throughout the spring and summer of 1941. Of 107 banded, 40 were recaptured for a total of 184 times. Most of them tended to remain near the area where banded, about 50 per cent of recaptures being within a 25-foot radius of the original banding site and less than 30 per cent beyond a 100-foot radius. All banded immatures recovered were within a 100-foot radius. One animal returned to the station where originally taken, although released over 320 yards distant. Most of the animals remained within a limited home range, but a few tended to occupy more extensive territory." Bibliography of 8 titles.

Ecology: Eelgrass decline

Dexter, Ralph W. Ecological significance of the disappearance of eel-grass at Cape Ann, Massachusetts, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 173-176.

The literature (24 titles cited) is reviewed and hypotheses as to the cause of the eelgrass decline are discussed. Previous to 1931, the plant was abundant in extensive beds near Cape Ann. Author's summary: "Zostera marina disappeared at Cape Ann, Massachusetts, in 1932, then returned in small isolated clumps and a few seedlings were produced. Between 1933 and 1940 the colonies increased yearly, growing chiefly from old rhizomes; most of the plants were diseased, and neither survived for long nor led to a significant return of the species. The disappearance of eel-grass disrupted an entire biotic community, removing a direct source of food for some aquatic birds and fishes, and indirectly affected many marine invertebrates, which in turn serve as food for other animals. Bare areas were created on shallow subtidal bottoms, and an agent in sedimentation and in the retention of shellfish was eliminated. Certain animals declined in abundance or disappeared entirely. The clam and lobster industries suffered severe losses. Only one advantage has been gained--that of removing a hazard to swimmers."

Ecology: Fire

Sampson, Arthur W. Plant succession on burned chaparral lands in northern California, Univ. of Calif. Agr. Expt. Sta. (Berkeley) Bul. 865, 144 pp., 46 figs., 17 tables, 1944.

This comprehensive report includes 3 pages (124-127) on the "Effect of Fire on Wildlife and Recreation," which are summarized (p. 133) as follows: "Wildlife and recreation sites are important in various chaparral areas. Fire destroys many small mammals, notably brush and tree dwellers, or they may die later from starvation. Destruction by fire of small surface-dwelling mammals, on the other hand, is mostly temporary; frequently because of the increased food supply, mice and squirrels soon increase in numbers in excess of those present before burning. Because of their mobility, coyotes and certain other large predators are little affected by fires of ordinary size. Deer are seldom injured by small fires, but extensive burns have sometimes resulted in their starvation, injury, or death. Small openings may appreciably increase the forage for deer, but larger burns destroy the protective cover and temporarily deplete the food supply. Extensive brush fires are also adverse to bird life, whereas small, judiciously placed spot fires may be beneficial by providing secluded feeding areas adjoining the unburned cover. Unfavorable reactions of streams which may follow extensive brush fires on surrounding watersheds, may decimate the fish population. Moreover destruction of natural vegetation by fire greatly lowers the value of otherwise attractive camp and recreation sites, and tends to divert the normal tourist trade from fire-swept regions for some time thereafter." Bibliography of 117 titles.

Ecology: Grassland

Costello, David F. Natural revegetation of abandoned plowed land in the mixed prairie association of northeastern Colorado, Ecology (Prince and Lemon Sts., Lancaster, Pa. $1.50 a copy), 25(3), July 1944, pp. 312-326, 5 figs., 6 tables.

Great Plains. "Many of these areas should never have been plowed and their best use may still be had only when they have been returned to a productive cover of native forage plants." Among the factors influencing succession are mammals. Jack rabbits clip some of the grasses before their seeds have

time to mature and kangaroo rats and white-footed mice entirely suppress certain grasses. Bibliography of 15 titles.

Ecology: Grassland

Shelford, V. E. Deciduous forest man and the grassland fauna, Science (Science Press, Lancaster, Pa. 15 cents a copy), 100(2590), Aug. 18, 1944, pp. 135-140, 3 maps; 100(2591), Aug. 25, 1944, pp. 160-162.

While the treatment of the grasses of the plains by the white man was notoriously bad, his consideration and management of the animals was in general even less intelligent. The settlers of America, accustomed to a deciduous forest environment, erred in their treatment of grassland. Overgrazing, prevalent from the beginning, exerted one of its worst effects through suppression of seed production; the necessity for plant replacement was ignored. Severe losses of cattle began in the winter of 1886-87. Overgrazing invited occupation of grasslands by sage-brush, cactus, and mesquite, and favored increase of certain rodents and grasshoppers. Homesteading was a final blow to much of the grassland. Due to prejudice and the carrying out of traditional practices, there was general warfare upon predatory animals. This permitted increase in rodents until they became seriously destructive. Control methods were applied wholesale, often without recognition of any values of the so-called noxious animals or of any other methods being practicable. The author presents the case for biological control and refers to the beneficial relations of rodents to soil and of predators to game species. Good management of the plains and their biota can be attained only through research, arguments for the establishment of which on an adequate scale are presented.

Ecology: Grazed and ungrazed woodlands

Dambach, Charles A. A ten-year ecological study of adjoining grazed and ungrazed woodlands in northeastern Ohio, Ecological Monographs (Duke University Press, Durham, N. C. $1.50 a copy), 14(3), July 1944, pp. 255-270, 9 figs., 6 tables.

Summary of an investigation, progress reports upon which have been noted in previous issues of WILDLIFE REVIEW. The author gives a description and history of the study area where his investigations were carried on for a decade, tells of the management practices adopted and of the results obtained. Populations of birds, mammals, and invertebrates and their response to the varying environments are discussed. Revegetation was steady in the woodlot protected from grazing. "Annual censuses of breeding birds for a five-year period indicate that they are four times more abundant in the ungrazed as in the grazed woodland and that the ungrazed area is host to twice as many species. Forty percent of the species and 60 percent of the pairs of breeding birds in the ungrazed area are ground or shrub nesting species as contrasted with but 27 percent of the species and the same proportion of pairs (27 percent) in the grazed area. Mammal populations show a somewhat similar correlation. It was estimated that there were 81 mammals per acre in the ungrazed as compared to 49 per acre in the grazed woodland at the close of the study period. All of the 14 species recorded occurred in the ungrazed area as contrasted to 12 in

the grazed area. Ten species were equally or more abundant in the ungrazed area. Red squirrels, and white footed mice, opossum and woodchucks were somewhat more abundant in the grazed area. Differences in soil and the number of stumps probably accounts for the greater abundance of opossum, woodchucks, and white-footed mice." Bibliography of 19 titles.

Ecology: Mosquito control operations

Wiebe, A. H., and A. D. Hess. Mutual interests of wildlife conservation and malaria control on impounded waters, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(4), Oct. 1944, pp. 275-283.

Authors' summary: "The experiences of the Tennessee Valley Authority during the past five years on the relations between malaria control and wildlife conservation on impounded waters indicate that many of the conflicts between these two interests are apparent rather than real; actually the two fields have several mutual interests. The following malaria control operations are also beneficial to wildlife conservation: reservoir clearance, marginal drainage, annual shoreline conditioning, control of aquatic plants such as lotus, use of constant pool levels and minimized seasonal recession in schedules for management of water levels, establishment of diking and dewatering areas, restricting human populations on some areas, minimizing the use of larvicides, and promoting biological methods for the control of Anopheles quadrimaculatus. Wildlife conservation also has mutual interests with the over-all health program such as the control of stream pollution." Bibliography of 8 titles.

Ecology: Populations, bobwhite

Baumgartner, F. M. Bobwhite quail populations on hunted vs. protected areas, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 259-260.

"Reduction of the autumn population by hunting to approximately the normal breeding density did not result in a decline in numbers of birds from year to year." "The ability of bobwhite to recover rapidly from heavy hunting losses, or from natural reduction in numbers, was also demonstrated clearly."

Ecology: Populations, raptor

Hiatt, Robert W. A raptor census in Montana, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 31(3), May 1944, pp. 684-688, 1 fig., 1 table.

Report on road counts over 2,459 miles; an average of 27 raptors were seen daily; one to each 4.5 miles. Record of the species (14) and numbers (551) observed is presented in the table; nearly half of the total birds seen were sparrow hawks. Localizations are discussed and the results are compared with those reported from other states. Bibliography of 9 titles.

Ecology: Populations, rat

Gunderson, Harold. Notes on a heavy Norway rat population, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(3), Aug. 1944, pp. 307-308.

On a farm in central Iowa 1,147 rats were removed from three acres in a period of some 30 days. This and other evidence pointed to an initial population in excess of 1,000 rats per acre. Notes on the damage done and on control measures applied.

Ecology: Populations, rodent

Storer, Tracy I., Francis C. Evans, and Fletcher C. Palmer. Some rodent populations in the Sierra Nevada of California, Ecological Monographs (Duke University Press, Durham, N. C. $1.50 a copy), 14(2), April 1944, pp. 165-192, 18 figs., 2 tables.

Rodents being second only to insects as converters of vegetation and of great importance as disease vectors deserve thorough study. The localities at which the present investigations were made and the methods employed are described. From experiments it was concluded that due to reinvasion, trapping is inefficient as a means of eliminating rodent populations. Poisoning with grain baits reduces rodents without conspicuous injury to other animals but also is inefficient for small areas because of reinvasion. Live trapping and marking of individuals is the best method now known for studying the composition of rodent populations. Accounts are given of the findings as to season of activity, breeding, growth, molt, home range, and territoriality for the most common species, and briefer mention of the others. Seasonal fluctuations in numbers are traced and their relations to food supply discussed.

"The total number of rodents per acre at Bass Lake varied from 60 in July-August to 30.9 in December; the average total weight per acre was estimated at 10.7 and 1.5 kg., respectively, for these two periods. The winter decrease was therefore twice as great, in terms of its bio-mass, as in numbers of individuals. Assuming that the food requirement of an animal is proportional to the 3/4 power of its body weight, the total daily food consumption (dry weight) per acre of the Bass Lake rodents was estimated at 0.74 to 1.17 kg. in July and 0.14 to 0.21 kg. in December. The July figures represent from 12 to 18 percent as much food as is required by a 342 kg. steer." Bibliography of 23 titles.

Ecology: Wolf, Alaska

Murie, Adolph. The wolves of Mount McKinley, National Park Service Fauna Series No. 5 (Supt. of Documents, Washington, D. C. 40 cents a copy), xix+238 pp., 59 figs., 20 tables, 1944.

A full and well-illustrated report upon more than two years of field study of the wolf-Dall sheep relationships in Mount McKinley National Park, Alaska. The ecology of the area and the characteristics, habits, and life

history of the wolves are discussed. The closest and most sustained observations of these animals ever made are interestingly described. Experience with individuals raised in captivity from an early age are reported. Food habits were studied mainly by scat analysis; the main sources of food utilized were caribou, mountain sheep, and ground squirrels. A number of additional items are listed and all are discussed. The Dall's sheep, caribou, grizzly bear, red fox, and golden eagle are treated in an equally detailed way, and the moose with only slightly less emphasis, all with special reference to their inter-relationships with the wolves. The paper is well summarized and has 2 pages of bibliography and an index. The author concludes that the wolves are the chief limiting factor upon the mountain sheep but no menace to maintenance of their populations. Caribou furnish a greater proportion of the food of the wolves and their status requires watching mainly, however, because they are subject to hunting. Moose have increased despite the wolves since they have been protected from hunting by establishment of the Park. The effects of the golden eagle on the sheep is negligible. The wolf population appears to be at its peak and may decline. "What the course of events will be during the next decade cannot be predicted with certainty because many fluctuating biological influences are at work. But Mount McKinley National Park is a small part of Alaska (half of 1 percent) and wolves are plentiful in many parts of the territory. It becomes obvious therefore, that whatever policy is practiced in the park will have an insignificant effect on the wolf and other wildlife populations in Alaska as a whole. In considering the wolf and the general ecological picture in Mount McKinley National Park it must be emphasized that national parks are a specialized type of land use. Wildlife policies suitable to national parks--areas dedicated to preserving samples of primitive America--obviously may differ from those applicable to lands devoted to other uses."

Economics: Fur animals, fisher

Rand, A. L. The status of the fisher, Martes pennanti (Erxleben), in Canada, Canadian Field-Naturalist (I. L. Conners, Central Experimental Farm, Ottawa, Canada. 40 cents a copy), 58(3), May-June 1944, pp. 77-81, 2 tables.

On about four-sevenths of the total area of Canada, "wild life, as game, food and fur resources are the chief factors that can make the country economically productive." The annual take of fishers from 1920-1941 is tabulated; the average number was distinctly less in the second than in the first decade: 3,510 compared to 5,622. Value per skin varied from $40 to $74. The animals are far more abundant in eastern than in western Canada. There is some discussion of cycles and of fisher farming. Author's conclusions: "The fisher is one of our scarcest and most valuable wild-caught furs. It was never common and is slowly decreasing in numbers. However even now a sizeable stock of animals exists in the wild, a stock that deserves close attention. If it decreases much more it may become so scarce as to be unable to recover its number if given protection. The total contribution of the fisher to the yearly fur output is so small that its temporary withdrawal from the fur trade for a few years, by protection, would work hardship on no one. Though the total fisher yield is but a small portion of the total fur catch, the value of

individual skins is such that a small increase in skins would mean a large increase in the value of the catch. One fisher skin might bring more than the average catch of a Nova Scotia trapper. The animal is worth strenuous efforts to increase its numbers, both for the substantial increase this would mean to trappers' incomes, and for the betterment of the status of the species in Canada. The cyclic nature of its fluctuation in numbers suggests one type of management to enable the fisher to recover more quickly from periods of scarcity, and to provide a larger harvest over more years, in periods of abundance. Fur farms are raising fisher, and successfully breeding them, but the yield from this source is as yet of little importance." Bibliography of 14 titles.

Economics: Fur animals, Nova Scotia

Rand, A. L. The recent status of Nova Scotia fur bearers, Canadian Field-Naturalist (I. L. Conners, Central Experimental Farm, Ottawa, Canada. 40 cents a copy), 58(3), May-June 1944, pp. 85-96, tables.

From a fourth to a third of the area of the Province has game and fur as its main assets. With 0.6 percent of the land surface, Nova Scotia produces 1.1 percent of the Canadian fur crop. Ranking of the species on the average value of the furs taken over 10-25 year periods shows the muskrat, mink, and red fox, in that order, in the lead. First in the value of individual pelts were the lynx, otter, and mink. Conservation of fur animals in the Province and their cyclic fluctuations are discussed. The fur bearers are then treated by species, attention being paid to protected status, abundance, importance in the fur trade, and general economic status. Bibliography of 15 titles.

Economics: Fur seal

Bower, Hard T. The fur-seal industry of the Pribilof Islands, Alaska, U. S. Fish and Wildlife Service (Merchandise Mart, Chicago 54, Ill.), Fishery Leaflet 77, 10 pp., 1 table (mimeographed), 1944.

This leaflet treats of the early history of the Pribilof Islands fur-seal industry, the leasing system that prevailed from 1870 to 1910, the effects of pelagic sealing, international protection of the fur seals of the North Pacific Ocean, government management of the herd, preparation of skins for the market, and growth in the herd and the annual take of skins. Figures illustrative of the last section are given in a table. In 1944, 47,652 skins were obtained and the herd was estimated to contain nearly three million animals. Bibliography.

Education: Conservation

Palmer, E. Laurence. Seven keys to wildlife conservation, American Biology Teacher (George W. Jeffers, State Teachers College, Farmville, Va.), 6(3), Dec. 1943, pp. 57-64.

Suggestions as to how a teacher may present the subjects of cover, predation, territory, travelways, food, breeding stock, and disease in relation to wildlife conservation.

Education: Natural history

Palmer, E. Laurence. The school, the war, and the leaflet, Cornell Rural School Leaflet (Cornell University, Ithaca, N. Y.), 36(1), Sept. 1942, 64 pp., illus.

Wildlife receives mention throughout under such heads as game protection, outdoor living and the soldier, armed forces and natural history, farmer-sportsman relationships, wildlife and taxes, wildlife and money, farmers and wildlife, forests and fur, are they vermin?, etc. There is also an annotated list of books useful in nature study.

Education: Ornithology

Palmer, E. Laurence. Aids to knowing natural science, The Birds (Slingerland-Comstock Co., Ithaca, N. Y. Set with binder $1.50), 178 pp., 178 figs., 1944.

For each species a single sheet, upon one side of which is an outline drawing by Louis Agassiz Fuertes, and on the other, text, giving common and technical specific, family, and ordinal names, measurements, description, statement of range and of most distinctive characters, notes, or actions, account of nest, eggs, and young, food, and economic status, and sometimes other notes. At the bottom of this page is a ruled space for entry of observations.

Food Habits: Birds vs. insects

Hendricks, G. Bartlett. Help for the gardeners, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 15(3), June 1944, pp. 2-5, 5 photos.

Popular article on the usefulness of birds in consuming insects.

Food Habits: Birds vs. Pentatomidae

Knowlton, George F. Pentatomidae eaten by Utah birds, Journ. Economic Entomology (E. N. Cory, College Park, Md. 75 cents a copy), 37(1), Feb. 1944, pp. 118-119, 1 table.

Tabulation and discussion of records of 53 species, in the stomachs of which "stink-bugs" have been found. They were identified in 225 out of a total of 2,573 birds.

Food Habits: Digestion of seeds

Swank, Wendell G. Germination of seeds after ingestion by ring-necked pheasants, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 225-231, 4 figs., 3 tables.

Review of 5 publications and one manuscript on the digestion of seeds by birds. Description of the writer's investigations in field and laboratory. Author's summary: "(1) The ability of the ring-necked pheasant to digest certain seeds and the viability of unbroken seeds voided by this bird were studied by collecting droppings in the field and testing the viability of whole seeds contained therein. Feeding tests with captive pheasants were made with a series of representative seeds. Seeds were fed in known numbers, one species at a time, and determination made as to their digestibility and as to the viability of undigested seeds; (2) the percentage of seeds that escape digestion varied between different species; those with hard coats were passed uninjured most frequently. Other things being equal, smaller seeds were passed in greater quantities than large seeds; (3) seeds that have passed through the digestive tract of the pheasant germinate more quickly than those not exposed to such treatment; (4) soft coated seeds, such as those of alfalfa, nightshade, millet, and flax, are almost all digested, but some are passed uninjured and viable; (5) wild grape, which has a very hard seed coat, showed the greatest resistance to breakage in the digestive tract, but more than 75 per cent of the seeds were digested; (6) contrary to the belief of Errington, a large proportion of rose seeds are broken and digested by pheasants; utilization sometimes is more than 95 per cent of those eaten; (7) it is recommended that seeds for food plot mixtures should include some easily digested and others that are resistant; (8) on management projects, advantage may be taken of the capacity of pheasants to disseminate seeds of food plants in the places they frequent, thus reducing the amount of artificial propagation required to establish adequate food and cover."

Food Habits: Nutritional value of squirrel foods

Baumgras, Philip. Experimental feeding of captive fox squirrels, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(4), Oct. 1944, pp. 296-300, 3 tables.

Author's conclusions: "The poor quality of red oak acorns as squirrel food is shown by loss of weight or death when used as an exclusive diet. This throws some light on the observation that squirrels, during a good acorn year (and also deer and raccoons) feed on white and black oak acorns but almost completely ignore those of the red oak so long as a supply of the former two is available. White and black oaks, therefore, should be given preference over red oak in selective cutting or planting for improvement of squirrel habitat. At Swan Creek these three are the only species of oaks of practical importance. The value of white oak is further enhanced by high rating as a den tree. Walnuts are important in squirrel management, but secondary to the acorn trees which produce the staple food. The results with field corn were somewhat contradictory and further tests are needed before drawing conclusions

as to its nutritional qualities; generally, its use by squirrels is secondary to natural foods."

Food Habits: Nutritional value of sumac fruits

Nestler, R. B., and H. W. Bailey. Sumac fruit as a food for bob-white quail, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 31(3), May 1944, pp. 689-696, 6 tables.

Discussion of the recorded value of sumac fruits and report on experiments with captive birds. Authors' summary: "Five feeding tests were conducted at the Patuxent Research Refuge, Bowie, Maryland, to determine the value of dwarf and smooth sumac fruits as the sole diet of quail as well as a supplement to other feedstuffs. When whole sumac fruits were force-fed quail, either alone or in combination with millet seed, many of the sumac seed were defecated undigested, whereas the millet seed was digested. Likewise, many sumac seed passed through the quail undigested when sumac fruit was fed ad libitum subsequent to a fasting period. The quail did not relish sumac fruit as the sole article of diet. They lost weight nearly as rapidly on the fruit, ground or whole, the ground seed, or the pulp as they did when not given any food. Quail maintained their weight for 14 weeks during the late fall and winter in outdoor pen on a diet containing 50 per cent sumac fruit-pulp and other feedstuffs of high feeding value. A severe neck molt, however, occurred during the ninth week. Quail lost weight rapidly on a diet containing 75 per cent sumac even though kept away from adverse weather conditions. A severe neck molt took place during the first week of this high-sumac diet. Heavy mortality occurred during the third and fourth weeks. Where the birds had a choice of many feedstuffs, they made sumac fruit 2 to 4 per cent of their diet. Therefore, it must be concluded, that even though sumac fruit is eaten by quail, and as a small percentage of the diet it may have a definite nutritional value, nevertheless as the sole or primary article of diet, it cannot be expected to maintain quail through a critical period in the winter."

Food Habits: Utilization of legumes

Neff, Johnson A. Seeds of legumes eaten by birds, Condor (J. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 46(4), July-Aug. 1944, p. 207.

Data relating especially to the band-tailed pigeon, white-winged dove, and Western meadowlark.

Food Habits: Utilization of willows

Massey, A. B., and Carleton R. Ball. The willows of Virginia, Bul. Va. Polytechnic Institute (Blacksburg), 37(9), July 1944, 31 pp., cover illus.

This excellent paper contains a section on willows as feed for mammals and birds and another on their value as cover for wildlife.

Food Habits: Of chickadee

Knowlton, George F. Some insect food of the chickadee, Bul. Brooklyn Ent. Soc. (311 East 4th St., Tucson, Ariz. 75 cents a copy), 39(3), June 1944, p. 85.

Penthestes atricapillus septentrionalis. Report on contents of 6 stomachs collected in Utah. Plant lice of 8 species predominated; beetles, scale insects, Collembola and other insects were taken, the scientific names of which are given.

Food Habits: Of curlew, European

Hibbert-Ware, A., and Robert F. Ruttledge. A study of the inland food habits of the common curlew, British Birds (H. F. & G. Witherby, Ltd., 326 High Holborn, London, Eng. 1 shilling 9 pence a copy), 38(2), July 1944, pp. 22-27.

As this species (Numenius arquata) is included in the Check-List of the American Ornithologists' Union, a report on its food habits even in Ireland may be of interest. Feeding habitats, roosts and resting places, methods of obtaining food, nature of the food material (from regurgitated pellets), and evacuation of gizzard linings by mouth and through the intestines are the topics treated.

Food Habits: Of deer

Carhart, Arthur H. What deer eat. By species, by season, by range and by preference, American Forests (919 Seventeenth St., Washington, D. C. 35 cents a copy), 50(8), Aug. 1944, pp. 383-385, 4 photos.

Popular account of a study in Colorado that included stomach examination and range analysis. The results are summarized by seasons. A deer requires 150 pounds of forage a month. The investigation yielded information of value in planning management.

Food Habits: Of deer, mule

Sooter, Clarence A. Some unusual foods of Oregon mule deer, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(2), May 1944, pp. 198-199.

Leafhoppers, grasshoppers, rootstocks of Hippuris vulgaris.

Food Habits: Of deer, white-tailed

Bramble, W. C., and H. K. Goddard. Seasonal browsing of woody plants by white-tailed deer, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 15(4), July 1944, pp. 8-9, 29, 3 photos.

Condensation of a report on a study of deer browse in the "Barrens" of Wittany Valley, Pa. Authors' summary: "Although white-tailed deer browsed all of the common woody plants in the bear oak forest type at one time or another during the year, they exhibited definite seasonal preferences that were correlated not only with differences in availability of the various species but also with seasonal differences in feeding habits and preferences. Of all the species browsed, sweetfern and prairie willow were utilized most heavily in the critical seasons of winter and spring; Jersey-tea, hawthorn, and Allegheny plum most heavily in summer; and Jersey-tea and sweetfern most heavily in the fall. Other species which were utilized heavily in the winter when other foods were scarce or unavailable were trembling aspen, dwarf gray willow, chokeberry, and bear oak. Service berry and dwarf chinquapin oak were moderately utilized during the winter. In a program of game management on areas occupied by the bear oak type, management practices should encourage those woody species which are consistently used as winter food by deer." Bibliography of 7 titles.

Food Habits: Of fish-eating animals

Dill, William A. The fishery of the lower Colorado River, California Fish and Game (Ferry Bldg., San Francisco 11, Calif.), 30(3), July 1944, pp. 109-211, figs. 47-82, 7 tables.

Predation is discussed on pp. 142-144; the principal fish-eaters present being listed and their food habits and legal status briefly stated. As most of the birds concerned are not wholly protected, "It might appear x x x that a considerable amount of local control could be (and probably is) exercised over these birds by hunters."

Food Habits: Of frog, leopard

Knowlton, G. F. Some insect food of Rana pipiens, Copeia (M. Graham Netting, Carnegie Museum, Pittsburgh, Pa. $1.00 a copy), 1944, No. 2, June, p. 119.

Summary of the stomach contents of 91 specimens from Utah and 6 from Idaho. The food was chiefly insects (which are specified) but included also: spiders, sowbugs, snails, a frog, shed frog-skin, and a little plant material apparently incidentally taken.

Food Habits: Of golden-eye

Wright, Philip L. American golden-eyes feeding on salmon eggs, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 46(3), May-June 1944, pp. 126-127.

Of land-locked sockeye salmon at Flathead Lake, Montana; several birds collected had been eating the eggs. However, fluctuations in water level are much more destructive to the salmon eggs than are the several hundred golden-eyes that winter there.

Food Habits: Of grouse, blue

Stewart, Robert E. Food habits of the blue grouse, Condor (A. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 46(3), May-June 1944, pp. 112-120, 8 tables.

Report on analyses in the Fish and Wildlife Service of the crop and stomach contents of 267 adult, and 21 juvenal, blue grouse. The geographic and seasonal distribution of the material is set forth, and the food is itemized by seasons and by age classes of the birds. The principal foods are discussed in some detail and the paper is summarized as follows: "The food habits of Blue Grouse vary from a simple winter diet that is made up predominantly of coniferous needles to a complex diet during the summer months, characterized by great variety of foods including green leaves, fruits and seeds, flowers, animal matter and coniferous needles. The spring and fall, which represent the transition periods between these two, are characterized by feeding habits that are generally intermediate. The diets of the two species of Blue Grouse, Dendragapus obscurus and Dendragapus fuliginosus, are quite similar as far as major types of food are concerned, but they differ considerably in the species that are taken. Such differences reflect differences in the vegetation within the ecologic and geographic ranges occupied by the two species."

Food Habits: Of grouse, ruffed

Gilfillan, Merrill C., and Hubert Bezdek. Winter foods of the ruffed grouse in Ohio, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 208-210, 1 table.

Report on the crop and gizzard contents of 26 specimens taken in fall and 16 in winter. The results are discussed and tabulated. On a volumetric basis, the fruits (with a few leaves) of greenbrier (Smilax) and the buds of aspen (Populus) were the most important items. By frequency of occurrence, witch-hazel, greenbrier, grape, blue beech, avens, and hawthorn were the leading contributors in northeastern Ohio, and greenbrier, sumac, dogwood, grape, brome-grass, and bittersweet in the southeastern part of the State.

Food Habits: Of gulls

Cotton, Clarence. Gulls as vegetarians, Condor (A. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 46(3), May-June 1944, pp. 127-128, 1 table.

Notable instances cited for 6 species; crop damage by three briefly discussed.

Food Habits: Of hawks and owls

Mendall, Howard L. Food of hawks and owls in Maine, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 198-208.

Digest of records from the journal of a taxidermist--Walter Clayton--relating to 7 species each of hawks and owls, of which fair collections were examined. There are also notes on 4 and 4 species, respectively, of these groups, representing smaller numbers of specimens. The author draws conclusions as to the economic tendencies of the birds concerned, which he arranges in the four classes: Distinctly beneficial, usually beneficial, neutral, and primarily detrimental. As to control, the author says: "Control, even of detrimental species, should be left to persons who know exactly what and why they are controlling. Mistakes in identification by farmers and sportsmen, especially among the medium-sized owls and soaring hawks, are notorious in all states where bounties have been paid. The writer knows of instances where the highly beneficial sparrow hawk was being persecuted by game technicians who believed the birds to be sharp-shinned or pigeon hawks. Most hawks and owls are difficult to identify even by trained ornithologists; hence, if poultry raisers and sportsmen in Maine believe that they must control 'vermin' their efforts should be confined to the two most detrimental species, the great horned owl and goshawk." Bibliography of 9 titles.

Food Habits: Of owls

Taylor, Walter P. Food habits of short-eared and barred owls in Texas, Texas Game and Fish (Texas Game, Fish, and Oyster Commission, Austin. 10 cents a copy), 2(7), June 1944, p. 24, 2 figs.

Inventory of the contents of the stomachs of 1 short-eared, and 3 barred, owls.

Food Habits: Of salamander, red-backed

Jameson, E. W., Jr. Food of the red-backed salamander, Copeia (M. Graham Netting, Carnegie Museum, Pittsburgh, Pa. $1.00 a copy), 1944 (3), Sept., pp. 145-147.

Report on examination of the contents of 169 stomachs collected near Ithaca, N. Y. Insects made up 73.2% of the total but the most important single item was earthworms, 6.7%. The foods are tabulated by family and larger groups.

Life Histories: Antelope

McLean, Donald D. The prong-horned antelope in California, California Fish and Game (Ferry Bldg., San Francisco 11, Calif.), 30(4), Oct. 1944, pp. 221-241, figs. 84-90, tables.

Appearance, early history, and present (greatly restricted) range are treated. Occupancy of the range by seasons, migrations, and highways also are discussed. Life history details relate to the rutting season, gestation period, care of young, habits, gaits, speed, vision, and the horns and their development. Census methods are described (that by airplane preferred) and counts for three years (1942-44) are given. The conduct of hunting seasons on a restricted license basis is related. Statistics are presented on live and dressed weights, and measurements, especially of the horns.

Life Histories: Armadillo

Sherman, H. B. The armadillo in Florida, Florida Entomologist (Gainesville, Fla. 35 cents a copy), 26(4), Dec. 1943, pp. 54-59.

The armadillo is thriving in certain localities east of the St. Johns River, apparently as a result of accidental transplanting. The article consists mainly of a review of literature, 15 titles being cited.

Life Histories: Beaver

Hatt, Robert T. A large beaver-felled tree, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(3), Aug. 1944, p. 315, 1 photo.

A cottonwood, 5 feet 7 inches in diameter above the cut; British Columbia.

Life Histories: Chipmunks

Shaw, William T. Brood nests and young of two western chipmunks in the Olympic Mountains of Washington, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(3), Aug. 1944, pp. 274-284, 4 pls., 1 fig., 1 table.

Eutamias amoenus and E. townsendii. Description of dens, nests, and young, including measurements and weights. Brief notes on habits of adults.

Life Histories: Cotton rat

Meyer, Bert J., and Roland K. Meyer. Growth and reproduction of the cotton rat, Sigmodon hispidus hispidus, under laboratory conditions, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(2), May 1944, pp. 107-129, 2 pls., 6 tables.

This report upon a laboratory study would not be abstracted here except for its inclusion of a resume of the occurrence, breeding and food habits, predators, and cycles of the cotton rat, based on outdoor observations. Bibliography of 18 titles.

Life Histories: Cottontail

Palmer, Ralph S. New England cottontail in Maine, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(2), May 1944, pp. 193-195.

Sylvilagus transitionalis. Spread of the animal especially since 1900. Destruction of woodland has favored the cottontail at the expense of the snowshoe hare.

Life Histories: Crow

Aldous, Shaler E. Winter habits of crows in Oklahoma, Journ. Wildlife Management (F. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(4), Oct. 1944, pp. 290-295, 1 fig.(map).

Author's summary: "(1) During the past 30 years, crow populations have increased in the wintering areas of Oklahoma because of more extensive agriculture both in Oklahoma and in the nesting areas in Canada. The favorable response of crows to the improved winter environment has more than offset the effect of control measures against them; (2) the birds start to migrate into central Oklahoma in September, reach their maximum winter populations about mid-November, and begin to leave during early February; (3) local factors conducive to large winter concentrations are the combination of an abundant food supply, favorable roosting sites, and mild winter climate; (4) roost populations vary from small groups up to 200,000 or more. Roosts can be found by following evening flight lanes or by inquiry among local residents. Individual birds use the same flight lane and some general feeding area each day; (5) crows can be utilized for human food, hog food, fertilizers, and feather products; (6) the food of crows in central Oklahoma in the early autumn is largely of insects, wild fruits, early-maturing grain sorghums, and Indian corn. During late autumn and winter they consume late-maturing grain, or that left in the field, and any that can be pilfered from corrals, hog lots, and feed stacks. In the spring the food changes largely to insects exposed by spring preparation of the soil and to spring oats; (7) pellets are regurgitated within two hours after crows enter a roost; (8) approximately 72 per cent of the birds taken from a roost near Verden, Oklahoma were Corvus brachyrynchos brachyrynchos and the others C. b. hesperus."

Life Histories: Grouse, Blue

Wing, Leonard, James Beer, and Jayne Tidyman. Brood habits and growth of 'blue grouse', Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 61(3), July 1944, pp. 426 -440, 1 fig., 8 tables.

Dendragapus fuliginosus and D. obscurus. Description of the study area in Okanogan County, Washington; and discussion of brood territories, brood counts, voice, growth-rate, and upward migration.

Life Histories: Lizard, Anniella

Miller, Charles H. Ecologic relations and adaptations of the limbless lizards of the genus Anniella, Ecological Monographs (Duke University Press, Durham, N. C. $1.50 a copy), 14(3), July 1944, pp. 271-289, 14 figs., 9 tables.

Studies in California of these worm-like lizards, of which the taxonomy, life history, enemies, parasites, and structures and activities in relation to the environment are discussed. The animals are both sedentary and scarce. They feed upon insect larvae, small beetles, and spiders. Bibliography of 23 titles.

Life Histories: Lizard, Uma

Stebbins, Robert C. Some aspects of the ecology of the iguanid genus Uma, Ecological Monographs (Duke University Press, Durham, N. C. $1.50 a copy), 14(3), July 1944, pp. 311-332, 22 figs.

In California deserts, inhospitable to life, these lizards live in dry, shifting sands. Their adaptations for arenicolous living are the main theme of this paper; food (chiefly insects), habits, and enemies also are discussed. Bibliography of 15 titles.

Life Histories: Lotus

Hall, Thomas F., and William T. Penfound. The biology of the American lotus, Nelumbo lutea (Willd.) Pers., American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 31(3), May 1944, pp. 744-748, 11 figs., 2 tables.

This plant is of minor importance to wildfowl and in good water management sometimes must be controlled. This account is of interest to all who have to deal with the species. The authors write on its distribution, morphology, and germination, the effects of water fluctuation on the plant, and methods of control. Recurrent cutting is effective. Bibliography of 8 titles.

Life Histories: Mustelidae

Pearson, Oliver P., and Robert K. Enders. Duration of pregnancy in certain mustelids, Journ. Experimental Biology (Wistar Institute, Woodland Ave. & 36th St., Philadelphia 4, Pa.), 95(1), Feb. 1944, pp. 21-35, 1 fig., 4 tables.

In respect to the matter investigated, mustelids may be divided into two groups: "Those with short gestation periods (ferret, mink, and skunk), and those which carry their young for an extremely long time (badger, weasel, marten, and fisher). It has been shown that in all the species of the second group the embryos are carried over the winter as small unimplanted blastocysts which become attached to the uterus in the spring and thereafter develop at a rate comparable to that of other mammalian embryos." Results of studies especially of the mink and marten are presented, including experiments in shortening the gestation period by increasing exposure to light. "It is suggested that implantation in those mustelids exhibiting delayed implanation is caused under natural conditions by the increased length of day in the spring." Bibliography of 34 titles.

Life Histories: Pheasant

Kirkpatrick, C. M. Body weights and organ measurements in relation to age and season in ring-necked pheasants, Anatomical Record (Wistar Institute, Woodland Ave. & 36th St., Philadelphia 4, Pa.), 89(2), June 1944, pp. 175-194, 16 figs., 1 table.

Author's summary: "A growth curve for a flock of artificially reared ring-neck pheasants was based upon live weights taken at approximately 5-week intervals from June 5, 1941, to March 22, 1943. Growth of the organs was studied by autopsying 177 pheasants to collect organ weights and measurements. The period of most rapid body growth was from 42 to 138 days of age and was correlated with increases in the thymus, pancreas, intestine, and caeca. The bursa also reached its maximum depth during this period. The heaviest body weights were reached in winter at 210 days and the lightest weights were recorded in the summer, corresponding with observations on some wild species. There was no evidence of seasonal fluctuations of body weight being positively correlated with changes in thyroid weights. In the first year, cocks began to lose weight before the breeding season, which commenced about April 1st, reaching their lowest weights in June. Hens in their first year did not lose weight until the breeding season began, and did not lose appreciably until the laying season was about over. Hens reached their lowest weight in August. The weight behavior of pheasants in their second year is dissimilar from that of the first year in that the maximum weights are attained not in winter but in the spring in both sexes. Some possible reasons for this dissimilarity are differences in food, age, weather, and number of birds weighed. In its seasonal development, the ovary lagged behind the testis more than a month although the growth of the ovary was more rapid. The hypertrophy of the gonads did not occur until the thymus had completely involuted and the bursa nearly so. There was evidence that the organs connected with digestion and assimilation of food are at their maxima during the period of most rapid body growth. No significant fluctuations were found in the weights of the pituitary, adrenal, heart, lungs, liver, and gizzard of either sex." Bibliography of 24 titles.

Life Histories: Pintail

Munro, J. A. Studies of waterfowl in British Columbia. Pintail. Canadian Journ. Research (National Research Council of Canada, Ottawa), 22, June 1944, pp. 60-86, 1 pl., 1 map, tables.

These satisfactory studies of the waterfowl are coming with great regularity from the pen of this author. The present installment deals with the distribution and seasonal movements of the pintail, reporting among other items the returns from some 8,500 banded individuals. The British Columbia birds keep to the western half of the continent. The author also discusses reproduction, sex ratio (34:66), food and feeding habits, and economic status. "Downy young feed largely on the larvae of aquatic insects. The most important item in the diet of adults during autumn and winter is seeds of various meadow and aquatic plants. On the coast this element is characterized by Polygonaceae and Scirpus americanus, in the interior by Potamogetons and Scirpus acutus. Insects and animal matter generally constitute a less important food." "The pintail is destructive of forage crops for a short time in each year over a limited area of British Columbia. In no other way does it conflict with human interests. What has been said of the mallard concerning its economic value in terms of a capital investment that derives all or part of its revenue from hunting, of recreational value, and of value as food, applies equally, although in a less degree, to the pintail. The destruction caused to crops is not great and apart from this largely controllable loss to agriculture the

species can be classified as a valuable item of wildlife resources. It is a source of wealth not only in the categories mentioned but also in less tangible aesthetic values of which more and more people are becoming aware."

Life Histories: Porcupine

Curtis, James D., and Edward L. Kozicky. Observations on the eastern porcupine, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(2), May 1944, pp. 137-146, 1 fig., 3 tables.

Report on observations in Massachusetts and Maine as to: distribution, feeding habits, movements, senses, physique, parasites, and enemies. Trapping and handling the animals are discussed and a holding funnel is described and illustrated. The authors' paragraph on economic status is herewith quoted: "The results of porcupine feeding is often spectacular and consequently emphasized as highly injurious. Compared with the volume of timber destroyed by fire, insects, fungi, and blazing, the damage wrought by porcupines is, in the writers' opinion, infinitesimal. While some large hemlocks were found killed because of repeated feeding, no instance of understocking due to feeding was found in the region covered by these observations. Many hemlocks have been found that were rendered useless for high quality lumber and much stag-headedness is caused in northern white cedar from feeding at the tops of this species. Other trees fed on can be found in various stages of disfigurement, but few trees fed on die as a result of feeding. Until careful appraisals of damage and population censuses are made over a period of years, the economic status of the porcupine can only remain a conjecture."

Life Histories: Rattlesnake, Sidewinder

Klauber, Laurence M. The sidewinder, Crotalus cerastes, with description of a new subspecies, Trans. San Diego Society of Natural History (San Diego, Calif.), 10(8), pp. 92-122, pls. 5-6, 2 figs., 4 tables.

Crotalus c. laterorepens n. subsp., Colorado desert sidewinder; description and statistics; them for both subspecies: comparative notes, ranges, color variations, morphology, ecological preferences, activities (especially locomotion), food, reproduction, relationships, key to the subspecies. Three-page bibliography.

Life Histories: Shrew, Short-tailed

Moore, Joseph C. A contribution to the natural history of the Florida short-tailed shrew, Proc. Fla. Acad. Sci. (Dr. R. E. Bellamy, Sec'y., State College for Women, Tallahassee), 6, 1943, pp. 155-166, 1 fig., tables.

Cryptotis floridana. Notes on distribution, habitat, and methods of collecting. The information on life history was mostly derived from a captive individual. Bibliography of 11 titles.

Life Histories: Skunk, Spotted

Crabb, Wilfred D. Growth, development and seasonal weights of spotted skunks, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(3), Aug. 1944, pp. 213-221, 2 pls., 2 tables.

Spilogale interrupta. Notes on behavior and growth of young in captivity. Data on weights of wild-trapped individuals by sexes and age classes.

Life Histories: Squirrel, Gray

Fitzwater, William D., Jr., and William J. Frank. Leaf nests of gray squirrel in Connecticut, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(2), May 1944, pp. 160-170, 1 fig., 3 tables.

Characteristics of the nests, their frequency of occurrence in various kinds of trees, and the materials used in building them are discussed. One hundred and forty-six nests were studied, of which 79 or 54.1 percent were in white pines. The average height was 36.39 feet. A great variety of substances were built into the nests, which harbored a considerable insect fauna in addition to fleas parasitic upon the squirrels. Bibliography of 18 titles.

Life Histories: Turkey

Leopold, A. Starker. The nature of heritable wildness in turkeys, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 46(4), July-Aug. 1944, pp. 133-197, 35 figs., 13 tables.

"The problem is of practical importance in wild turkey management because the intermixing of the domestic strain with wild populations has had certain adverse effects upon the hardiness of the native turkey of Missouri." The domesticated bird is unable to maintain itself in the wild in the United States, lacking the necessary factor of "wildness." It readily hybridizes with wild stock and in so doing produces offspring less fitted than pure native stock for independent life. This process has endangered management programs in Missouri [and elsewhere]. This investigation of "wildness" has been carried out in a detailed and thorough way. It is a heritable, physiological complex, the measure of which is the ability of strains to survive in a natural environment. The article contains information on management practices, propagation, stocking and survival of planted birds, populations, life history, reproductive success, molts, weights, measurements, sexual characters, relative sizes of brains and certain endocrine glands, and adaptation. Bibliography of 52 titles.

Life Histories: Wolverine

Woods, Gordon T. Longevity of captive wolverines, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 31(2), March 1944, p. 505, 1 fig.

Records of 57 wolverines, Gulo luscus (Linnaeus), in zoological parks and zoos in United States and Canada were examined and show that wolverines may live 15 years in captivity. The average length of life of 45 wolverines surviving more than 6 months was about 5-1/2 years. Autopsies at the Detroit Zoological Park indicate that infections of the teeth and throat are the primary causes of death among adults. --Gordon T. Woods.

Life Histories: Wood rat

Horton, Jerome S., and John T. Wright. The wood rat as an ecological factor in southern California watersheds, Ecology (Prince and Lemon Sts., Lancaster, Pa. $1.50 a copy), 25(3), July 1944, pp. 341-351, 2 figs., 5 tables.

Populations, nest construction, and food collection and storage were given special attention. Authors' summary: "The San Diego wood rat, Neotoma fuscipes macrotis, is one of the most abundant and typical rodents of the chaparral formation of the San Gabriel Mountains in southern California. Its preferred habitat is chaparral of medium to heavy density where there is suitable protection and abundant food. Throughout the watersheds studied, the population averaged 4.6 rats per acre. Each rat occupied a large nest built of branches and twigs, with living and food-storage compartments. The food stored in these nests was used as a basis for determining the food habits of the animal. At altitudes below 4,500 feet, leaves and twigs of Quercus dumosa furnish most of the food throughout the year. Leafage of many other chaparral species is also used, with Umbellularia californica and Photinia arbutifolia most important during the winter and Ceanothus crassifolius, Cercocarpus betuloides, and Populus trichocarpa most important in the summer. The typically small quantity of food stored in these altitudes was less in the summer than in the winter. At altitudes above 4,500 feet, the storage of acorns in the fall, principally of Quercus wislizenii var. frutescens, was conspicuous. Snows at this altitude require the animal to have a large amount of material for winter use, which includes besides the acorns much leaf material of Quercus, Ceanothus divaricatus, and Arctostaphylos glandulosa. The activities of this rodent do not exert any appreciable influence upon the vegetation cover of the chaparral watershed, with the possible exception of the heavy use of acorns at the higher altitudes." Bibliography of 7 titles.

Management: Antelope

Knipe, Theodore. The status of the antelope herds of northern Arizona, Arizona Game and Fish Commission (Phoenix), 40 pp., 1 photo, 8 maps, 1944.

Description of the antelope range of more than 10 million acres, including notes on the climate, types of vegetation, principal plants, condition of the forage, and water resources. Land ownership is discussed; private holders of large areas seem to have "an honest concern as to welfare and management of the antelope herds." Some damage is done by the animals and this bears most heavily upon the occupants of smaller tracts. Both past and present distribution of the antelope herds is treated with reference to limiting factors, con-

centrations, seasonal movements, and numbers. Losses due to predation, poaching, and weather are outlined. Hunting is desirable as a means of regulating the sex ratio. Management suggestions relate to predator control, guarding of the animals, transplanting, refuges, salt distribution, water development, and regulation of hunting. Further study should be made of life history, range utilization, and disease.

Management: Beaver

Lay, Daniel W. Dr, Beaver, specialist, Texas Game and Fish (Walton Bldg., Austin. 10 cents a copy), 2(10), Sept. 1944, pp. 4-5, 13, 4 photos.

General account of life history and dam-building proclivities. Trapping in some localities has been decimating and remedial legislation has been enacted. Results of transplanting; very few of the animals stayed where they were released; some travelled 150 miles or more.

Management: Bobwhite

Hendrickson, George O. The bob-white quail in Iowa, Iowa Conservationist (Iowa State Conservation Commission, Des Moines), 3(9), Sept. 15, 1944, pp. 70, 71, 72, 1 photo.

History of experimental shooting on quail management areas and on independent farms under a permit system. Experience "definitely proved that quail could be shot by the hunters and still leave the coverts filled to the maximum winter carrying capacity." Among the results of research, "Very detailed investigations of predators such as fox and great horned owl showed them not responsible for losses in coveys well-situated in regard to protective cover and food." Open seasons were regulated according to the results of quail censuses and a restocking campaign was carried on. "More farms are opened each year to hunters, who are multiplying in numbers, and the use of bird dogs is increasing tremendously." "Both farm and town folk are now well acquainted with the measures necessary to have and keep quail in this state and how the quail fits into the long-time economic and cultural welfare of the state. Our people can be depended upon to support the Commission in its findings and regulations, and to rally to the care of the bob-whites should emergencies arise. The bob-white quail are more numerous than 25 years ago and certainly are safer now than ever before in Iowa."

Management: Bobwhite

Terrill, Harold V. Essentials for more bobwhite quail in Missouri, Missouri Conservation Commission (Jefferson City) Conservation Bul. 2, 4 pp.

Suggestions as to the improvement of cover (of 4 types) and the food and water supplies as well as recommendations as to control of burning.

Management: Bobwhite

Wilson, Kenneth A., and Ernest A. Vaughn. The bobwhite quail in eastern Maryland (Game and Inland Fish Commission of Maryland, 514 Munsey Bldg., Baltimore 2), 138 pp., 6 pls., 41 figs., 11 tables (incl. graphs), 1944.

Summary of 8 years' study and management of bobwhites on the Pocomoke State Forest, several progress reports upon which have been abstracted in earlier issues of WILDLIFE REVIEW. The history of the project is outlined and the study areas are carefully described and mapped. One of the first steps in management was thorough drainage. "The cost was high but when it was finished, the land was no longer 'sick', it was growing more timber and more quail and had more than doubled in value by the operation." Strips cleared for wildlife development, while 17 miles in combined length, totalled only about 160 acres in area. The strips proved convenient for working and useful to wildlife especially through edge effects. The system of food plantings is described; corn with soybeans was the best annual food-patch combination. Greens and perennials also were planted. Experience with a considerable variety of plants is related. Food habits were studied chiefly by analyses of droppings; these are reported on by habitat types and seasons. A list of vegetable food items is presented from which it is evident that outstanding food producers were: ragweed, beggarweeds, Lespedeza, cowpeas, soybeans, and pines. The effects of ecological succession upon food and cover plants is described. In the discussion of predators, information is given on food habits of a variety of birds and mammals. The findings as to predation are in harmony with those of other modern investigations. The authors state that "Information gathered during the past eight years establishes without doubt the fact that predators have nothing to do with the present carrying capacity of the areas. The presence of many foxes and accipitrine hawks potentially capable of catching quail but with little apparent success indicated optimum cover conditions and also suggests a substantial supply of buffer food species like mice, rabbits and songbirds." Among the census methods tried, track counting was of most value. Counts showed that management increased the population and maintained it at a much higher average level (though with some fluctuation). Covey territory and range varied from large to small in inverse proportion to the excellence of the environment. The authors detail some interesting observations on the birds from a blind, particularly as to the coactions of the quail and a Cooper's hawk. Management for hunting, its costs, and results are discussed. Costs varied in different years from 11 to 63 cents per bird. Forest management and quail management fitted well together. Farmer-sportsman relationships improved. Bibliography of 28 titles.

Management: Buffalo

Cahalane, Victor H. Buffalo go wild, Natural History (American Museum of Natural History, New York, N. Y. 50 cents a copy), 53(4), April 1944, pp. 148-153, 8 photos.

Popular account of the near extirpation of buffalos and of their increase as fostered by man, particularly as exemplified by the Yellowstone Park

herds. The undesirability of artificial feeding is emphasized. The "tame" herd in Yellowstone is to be eliminated and the "wild" gradually forced to depend upon the natural range for its subsistence. "To preserve these wild buffalo, we must preserve the Park. By keeping all of the types of animals below the carrying capacity, the range will ultimately be restored to provide adequate winter forage for larger numbers. And while this rehabilitation is taking place, even a small herd of wild, thundering buffalo will be more interesting to the visitor than a larger herd of apathetic zoolike animals."

Management: Deer, White-tailed

Buechner, Helmut Karl. The range vegetation of Kerr County, Texas, in relation to livestock and white-tailed deer, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 31(3), May 1944, pp. 697-743, 8 figs., 13 tables.

Methods of the study are described and previous investigations noted. Consideration is given to habitat factors, past history of the vegetation and of the livestock industry in the region, present plant growth (in ecological detail), and the interrelationships of vegetation, livestock, and deer. From author's summary [correction supplied by W. P. Taylor]: "Range lands in the county are mostly stocked at 70 to more than 100 animal units per section. These rates of stocking cause the elimination of the valuable, more palatable grasses and produce the three-awn grass or forb stage of succession. Much of the ground vegetation at the present time is in the three-awn seral stage; only on properly stocked ranges are curly mesquite or grama grasses dominant. Indications are that not more than 50 animal units (including deer) should be placed on one section of 640 acres. Many of the ranches are leased for white-tailed deer hunting. Since deer provide a substantial portion of the ranch income, it is desirable that they be maintained in shootable numbers on a sustained yield basis. A critical problem in the maintenance of shootable white-tailed deer populations, though not yet manifest on all of the range lands of the county, is the control of available browse. Overstocking with goats has been responsible for great reductions in available browse; and if the practice is continued, declines in the deer population are inevitable. The range lands of Kerr County are particularly well-adapted for the production of deer; effort should be directed more completely toward the inclusion of these animals in the range management programs. Maintenance of more favorable vegetative conditions, through lighter grazing and direction of management practices to include deer as well as livestock, should insure the continuance of deer in shootable numbers." Bibliography of 23 titles.

Management: Deer, White-tailed

Moore, George C. White-tails in Alabama, Alabama Conservation (Alabama Dept. of Conservation, Montgomery 4. 5 cents a copy), 15(3), Feb. 1944, pp. 8-9, 12-14.

A short history is given of the white-tail deer in Alabama. The original range covered most of the State until about 1880. By 1890 the deer had declined to a low level and had disappeared from a large proportion of the

State by 1900. Agricultural land clearing and wholesale lumber cutting together with increased hunting pressure were responsible. Beginning in 1907 a buck law was enacted and measures begun to salvage the species. This study reveals that deer are now present in 28 of the 67 counties and the total population is estimated at 14,105 animals, the majority of which are in the 12 southwestern counties. A chart is included showing the estimated deer by counties and the percentage of cultivated land in each county. The inverse correlation between these factors is apparent. Only one county of the 25 having 70 percent or more of the land in cultivation has any deer present.--F. C. Edminster. (From Biological Abstracts.)

Management: Dove, Mourning

Anon. Information concerning the investigation of the mourning dove in North Carolina, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh), 8(8), Aug. 1944, pp. 5, 16.

Statement of the scope and other features of the investigation. In three years, from 10 to 16 percent of the doves were feeding young in September. The number of doves decreases in that month but increases in October and later months. Recommendations as to the shooting season based on these findings are made.

Management: Forests in relation to wildlife

English, P. F. Forestry and wildlife management, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 15(3), June 1944, pp. 6-7, 2 photos.

"Accepted forestry practices need be modified only in very minor details in order to maintain woodlands in the best possible conditions for wildlife and forestry. In this way the greatest use of the land can be maintained. The location of game refuges, the annual harvest, and the control of predatory animals in forest areas are matters of game policy and administration." The wildlife of forests is listed and its place in a multiple-use program discussed, as is also the relationship to wildlife of such forestry operations as cutting weeding, and thinning. Harvesting of wildlife must be so conducted as to prevent overpopulation and predator control must be carefully safeguarded.

Management: Fur animals

Allan, Philip F. Fur from farm lands, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 9(11), May 1944, pp. 256-261, 5 photos, 1 table; 9(12), June 1944, pp. 283-286, 5 photos.

The value of fur animals for their yields of fur, fat, and food is stressed and estimates are made of the numbers of 5 leading groups of fur-bearers taken annually in the United States (except the Southwest) total 16,418,000. "Farm lands x x x produce more furs than forests and wilderness, acre for acre, and the wildlife lands on inland farms sometimes outyield even the coastal marshes." Suggestions are made as to improving conditions for fur

animals about marshes, streams and ditches, lakes and ponds, rock outcrops, gullies, and box canyons, croplands and pastures, and woodlands. The second installment of this article discusses: artificial dens for fur animals, protecting burrowing animals, how to harvest safely, care of pelts, and damage by furbearers.

Management: Fur animals

Erickson, Arnold B., and Thomas A. Schrader. Trapping is big business, Conservation Volunteer (Minnesota Dept. of Conservation, State Office Bldg., St. Paul), 7(41), July-Aug. 1944, pp. 1-8, 3 tables.

The total number of pelts taken in the State has increased yearly since 1939. A tabulation is given of the catch by species for 1942 and 1943. The number of skins for the latter year was more than two millions, and their value over five million dollars. Muskrat hides were far in the lead in both number and value. The takes of this animal and of the beaver are discussed in some detail. The catch of beavers is separately tabulated and information on the number of colonies is presented. These valuable fur animals have been overtrapped and should be given protection.

Management: Fur animals

Nagel, W. O. Fur as a crop on Missouri farms, Conservation Commission (Jefferson City), Conservation Bul. 3, 12 pp., 7 figs.

Fur production was at its maximum in 1920 when trappers received $1,300,000 for their catch. After a decline there has recently been some improvement. Economic value through food habits is discussed and the author states: "When we consider the benefits they provide--destruction of crop pests, removal of carrion, sport, and cash income--the furbearers are second to no other wildlife group in their value to the farm. As a crop they are unique, for almost any other pay crop costs something to raise and is a drain on the fertility of the soil. Furbearers, on the other hand, cost the farmer next to nothing, benefit him throughout the year, and produce pelts of economic value. Before these benefits can be realized to the fullest extent, however, there are two changes that need to be brought about: (1) Improved living conditions for furbearers, to increase the populations, and (2) improved methods of taking, preparing, and marketing pelts, to increase the cash return." He then proceeds to suggestions as to bettering food, cover, and water supplies for the fur animals, improving methods of harvesting, including illustrated directions for the preparation of pelts. Bibliography of 11 titles.

Management: Grouse, Ruffed

Ryder, W. C. A review of the ruffed grouse, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 15(3), June 1944, pp. 10-11, 24-25, 7 photos, 1 table.

Tabulation of the annual grouse kill in Pennsylvania, 1915-1942, reveals great fluctuations. There were two closed season (1918, 1929) in the period and two years (1930, 1936) in which the kill fell below one-sixth of the maximum, which was 600,000 for 1922. Rather pessimistically the author says that despite detailed studies, "probably less is now definitely known about the ruffed grouse than any of our other game birds." However the requirements of the species so far as they are known are discussed and suggestions made for meeting them. The management factors indicated are control of: shooting, competition with other game species, and ecological succession of food-producing plants. Suggestions are made for attaining these ends. Bibliography of 21 titles.

Management: Harvest, fur, California

Twining, Howard. The fur catch in California 1940-1941, California Fish and Game (Ferry Bldg., San Francisco 11, Calif.), 30(4), Oct. 1944, pp. 242-246, 1 table.

The catch is tabulated by species; estimated total number of animals some 155,000, value of the furs nearly $189,000. To this must be added more than 11,000 animals taken by predator trappers. The statistics are further analyzed.

Management: Harvest, waterfowl

Bellrose, Frank C., Jr. Waterfowl hunting in Illinois: its status and problems, State Natural History Survey (Urbana), Biological Notes No. 17, 35 pp., 17 figs., 5 tables, photos (processed), March 1944.

Many fold increase in the number of hunters with concurrent decrease in hunting areas has resulted in great congestion and unsatisfactory results. The author gives concise general information about private and public shooting grounds, discusses in more detail those representative of different regions of the State, and makes suggestions as to how conditions may be improved. Whether or not it is possible to increase the area of public shooting ground, it is apparent that some means must be found to limit the number of hunters.

Management: Herd regulation, buffalo

Cahalane, Victor H. Buffalo. Wild or tame?, American Forests (919 Seventeenth St., Washington 6, D. C. 35 cents a copy), 50(10), Oct. 1944, pp. 472-475, 6 figs.

Review of buffalo abundance and decline. Establishment of the Yellowstone herd from a small beginning; its care approximating that of domesticated animals; to prevent utter dependence upon artificial shelter and feeding, natural management must be adopted and the number of the animals kept well within the carrying capacity of the environment. A beginning in herd reduction has been made and it is hoped that eventually the animals can be maintained in a completely wild state.

Management: Herd regulation, deer

Bartlett, I. H. North Manitou Island's deer herd, Michigan Conservation (Michigan Dept. of Conservation, Lansing 13), 13(8), Sept. 1944, p. 10, 1 photo, 1 map, 1 table.

On isolated Manitou Island of 22 square miles, from two bucks and five does released in 1925 the deer increased until overbrowsing became manifest in 1937. Winter feeding (with oats) began and has been continued. To control the herd an increasing number of animals of both sexes has been taken, the bag rising from 18 in 1937 to 292 in 1943. Operating under the Michigan game breeders' license law the proprietary Association is in position to kill any number of animals required to keep the deer population within practical limits.

Management: Herd regulation, deer

Feeney, William. The present status of Wisconsin's deer herd and deer range, Wisconsin Conservation Bulletin (Wisconsin Conservation Dept., Madison), 9(6), June 1944, pp. 4-5.

Recent mild winters, allowing deer to roam rather than yard, decreased damage to the food supply, but overbrowsing had already occurred in many areas. The problem is general in the northern part of the State and "reduction of breeding stock is the only possibility for preventing further range setbacks." Of all the real and imagined dangers in deer management, "the greatest is irreparable range damage because of delayed action."

Management: Herd regulation, deer

Fischer, George A., John C. Davis, Floyd Iverson, and F. P. Cronemiller. The winter range of the interstate deer herd, Modoc National Forest, California, U. S. Forest Service, Region 5 (760 Market St., San Francisco), 20 pp., maps, tables (processed), 1944.

Management of this herd has been complicated by its range overlapping the boundary between Oregon and California but progress has been achieved since arrangements for joint action were made. The herd has kept growing despite rather large hunter kills, has depleted food supplies, and forced reduction of the number of cattle run on the area. This paper discusses history of the case, reports upon the methods and results of a new survey, and makes management recommendations. The principal one is for herd reduction.

Management: Herd regulation, deer

Hill, R. R. Nebraska's deer, Outdoor Nebraska (Game, Forestation, and Parks Commission, Lincoln, Nebr.), Summer 1944, pp. 7-8, 1 photo, 1 graph.

In the sandhill region of Nebraska are about a thousand mule deer that are now at about the limit of carrying capacity of the range. Their life history is briefly, and their feeding economy more lengthily, discussed. An

interesting graph of the annual food is presented that is based on analyses of the contents of 400 stomachs. Important as food producers among trees are: red-cedar, and Scotch, Austrian, and jack pines; and among shrubs: redroot, sand cherry, choke cherry, sandhill willow, buckbrush, and rose. Feeding and removal are both impracticable and herd regulation is needed.

Management: Herd regulation, deer

Leopold, Aldo. What next in deer policy?, Wisconsin Conservation Bulletin (Wisconsin Conservation Dept., Madison), 9(6), June 1944, pp. 3-4, 18-19 (a graph).

The 1943 kill (total 105,100) is tabulated by age classes and its effect in herd reduction is discussed, as is also starvation both of fawns and adults. Deer overpopulations in Michigan, Utah, and Pennsylvania are compared with that in Wisconsin, which through an earlier start may be successfully controlled by persistent elimination of does. "The longer the reduction of an irruptive herd is postponed, the lower will be the ultimate level at which equilibrium with the winter food is reestablished." The history and probable future of the Wisconsin deer herd are the subjects of a 2-page graph.

Management: Herd regulation, deer

McKean, Wm. T. Black Hills winter deer loss, South Dakota Conservation Digest (South Dakota Game and Fish Dept., Pierre), 11(8), Aug. 1944, p. 10.

This is another area of overpopulation. During the winter of 1943-44 from 2 to 3 thousand mule deer perished, 70 percent of them fawns. Adults dying were mostly does. Careful regulation of the use of the range by all types of grazing and browsing animals will be required until the vegetation can restore itself--a process that will take many years.

Management: Inventory, red fox

Bach, Roy H. Preliminary study on North Dakota red fox, North Dakota Outdoors (State Game and Fish Dept., Bismarck. 5 cents a copy), 7(3), Sept. 1944, pp. 18-19, 1 graph, 1 map.

Summary of the results of analyses of the contents of 132 fox stomachs (14 percent game birds, 1 percent poultry); discussion of the animal's economic value; from fur sales alone, it was $250,000 last year. The graph shows the status of fox populations in 1943-44, and the map indicates densities of occurrence throughout the State.

Management: Inventory, upland game birds

Bach, Roy H. North Dakota upland game census for 1944, North Dakota Outdoors (State Game and Fish Dept., Bismarck. 5 cents a copy), 7(3), Sept., 1944, pp. 6-8, 3 maps, 1 table.

The tabulation summarizes the principal facts obtained in the years 1941-44, and the maps indicate the 1944 status of populations of the ring-necked pheasant, the Hungarian partridge, and the prairie grouse.

Management: Inventory, yield of acorns

Downs, Albert A. Estimating acorn crops for wild life in the southern Appalachians, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(4), Oct. 1944, pp. 339-340, 2 tables.

Quantitative data on acorn production by 5 species of oaks, defective and damaged fruits subtracted. An average acre produced about 123 pounds of sound fruit.

Management: Planting for game birds

Pearson, Allen M., and D. G. Sturkie. Food crops for game birds on farm lands, Alabama Polytechnic Institute Agr. Expt. Sta. (Auburn), Circ. 90, 20 pp., 5 pls., 2 charts, June 1944.

An excellent result of the Cooperative Wildlife Research Program; it is well organized, clearly stated, and functionally illustrated with photographs of good quality. It tells what, where, when, and how to plant, discusses the use of fertilizer and the control of rabbits and cotton rats, and recommends a number of wildlife crops for planting. The winter mixture developed by the Cooperative Quail Study Association is pronounced best for its purpose. The charts graphically delineate planting dates, state the proper rates of seeding, and show the seasons when food should be available from the plantings. Authors' summary: "(1) Much of the food needed by game birds in Alabama can be provided by diversified farming, especially the harvesting of crops by hogs and other livestock. The principal need for special wildlife plantings on farm lands is to alleviate the food shortage that is usually most severe during March and April; (2) game bird food plantings are compatible with good farm management, and for the most part they should be located along field borders and fence rows; (3) wildlife plantings should be included in long-time farm management plans and should not be treated merely on a temporary basis; (4) the most useful plants now recommended for long-time wildlife plantings under Alabama conditions are: bicolor lespedeza; large, or showy, partridge pea; and common lespedeza. These crops can be maintained from year to year at very little expense; (5) plantings of benne, cowpeas, sorghums, millets, peanuts, and certain other annuals can produce much bird food for a temporary period. However, the cost is usually prohibitive, unless they are grown primarily for general farming purposes."

Management: Planting for wildlife

Cook, David S., and Frank C. Edminster. Survival and growth of shrubs planted for wildlife in New York, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 185-191, 3 figs.

In connection with the revegetating of eroded lands in southwestern New York, 13 species of shrubs and trees that produce food for wildlife were tested with stock produced in nurseries of the Soil Conservation Service. The methods used and the results obtained, 1941 to date, are reported. From authors' summary: "Three site treatments were used: plowing the site gave the best growth and highest survival, whereas scalping proved only a little better than slit planting in undisturbed sod. Two grades of stock, standard and cull, were tested; the former showed definite and consistent superiority. The extra cost of plowing is more than offset by greater ease of planting and better growth and survival. At the end of the third growing season, the most promising species were arrowwood, multiflora rose, early shrub lespedeza, silky dogwood, black chokeberry, and barberry."

Management: Pond

Tulenko, Paul. Aquatic plants for multiple purpose farm ponds, Missouri Conservation Commission (Jefferson City), Bul. 16, 12 pp., 18 figs., 1944.

Brief illustrated accounts of plants that may be used to check wave erosion, aid in keeping the water clear and oxygenated, and provide food for wildlife. Directions for collecting and transporting planting material, and for avoiding or controlling undesirable plants also are given.

Management: Range

Johnson, Harlen G. Big game, livestock, and proper land use, Arizona Wildlife and Sportsman (Safford, Ariz. 15 cents a copy), 6(5), May 1944, p. 11.

There is no competition between big game and livestock so long as there is sufficient forage to meet the needs of both under use that does not impair plant cover of the range. While preferences of the two classes for habitat and for food tend to diverge, the dividing lines are not positive and disappear in emergencies. Livestock management should be realistic; with better stock the head can be reduced while meat production is maintained or even increased. "The question of big game and domestic livestock on national forest ranges is not so much a matter of conflict between the two classes as it is of keeping the numbers of both classes consistent with the sustained production of forage on the area concerned. In other words, it is believed that our problem is primarily one of applying practical range management principles, which means proper use of the forage crop, maintaining game physically strong so as to ward off excessive losses from predators, avoid the ill effects of congestion which tends to spread disease, prevent an unbalanced sex ratio, and in other respects safeguard the welfare of both big game and livestock."

Management: Stocking

Anon. Hits, misses, and home runs, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 15(4), July 1944, pp. 4-5, 28, 30, illus.

Popular summary of the State's experiences in attempting the stocking of 9 species of game birds and 7 of game mammals. Only one of 6 exotic birds, the ring-necked pheasant, became well-established, and one, the Hungarian partridge, is wavering between hanging on and failure. Other birds and all of the mammals concerned were of native species, the stock of which needed replenishment.

Management: Stocking, Canada goose

Pirnie, Miles D. Canada goose restocking, Game Breeder and Sportsman (1819 Broadway, New York, N. Y. 25 cents a copy), 49(4), April 1944, pp. 38-39, 1 photo.

Pinioned birds stocked at the Kellogg Bird Sanctuary have in time been replaced by fliers and there has been a gradual increase in the breeding population in nearby areas. Shooting appears to take less than 10 percent of the total number annually.

Management: Stocking, mountain goat

Harmon, Wendell H. Notes on mountain goats in the Black Hills, Journ. Mammalogy (Ernest T. Hooper, University of Michigan, Ann Arbor, $1.00 a copy), 25(2), May 1944, pp. 149-151.

Introduced in 1924 the animals have thrived and increased to an estimated more than 200. Notes are given of food and general habits and reproduction, "To prevent this herd from exceeding the natural carrying capacity of the range, some hunting should be permitted within a very few years."

Management: Stocking, chukar partridge

Anon. The chukar partridge in Wisconsin, The Passenger Pigeon (W. R. Barger, 4333 Hillcrest Drive, Madison 5, Misc.), 6(2), April 1944, pp. 41-42, 2 photos.

Brief notes on appearance and native range. First planted in Wisconsin in 1936; counties where stocked and where subsequently observed are mentioned. Food and breeding habits are briefly summarized. The birds show considerable tendency to wander. "A sharp curtailment of the Chukar stocking program in Wisconsin has been effected. If the birds at the end of a two- or three-year period appear to have acclimated and adapted themselves to Wisconsin conditions, resumption of the larger program will be undertaken. If the birds do not appear to be suitable to the state, the present stocking program will be discontinued except for experimental plantings on an extremely limited scale."

Management: Transplanting cottontails

Graner, Wilbur H. Out where they belong!, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 15(7), Oct. 1944, pp. 4-5, 26, 5 figs., tables.

Trapping on unhunted areas by licensed individuals and groups yielded some 33,000 cottontails in one year, at a cost of about $12,000. The animals were released in hunting territory. Other creatures trapped and transplanted in the same period were 1,589 pheasants, 547 squirrels, 275 muskrats, and 75 raccoons.

Management: Transplanting moose

Hickie, Paul F. Michigan moose, Game Division, Michigan Dept. of Conservation (Lansing), 57 pp., photos, tables. n.d.

Review of early history of moose in the State; like other large mammals it was at one time nearly extirpated. The reservation of Isle Royale as a national park preserved a nucleus herd which apparently invaded that area in early 1900's and replaced the caribou. By 1930, there were from one to three thousand animals there and overbrowsing was evident. By 1954, malnutrition was serious and mortality severe. Public opinion was adverse to reducing the number of moose either by the introduction of wolves or by hunting, so trapping and removal were tried. The methods used, the difficulties experienced, and the results obtained are described. In three years, 71 of the animals were transferred to other areas.

Management: Turkey

Blakey, Harold L. Welfare of the wild turkey closely associated with range management, Progress Report, Division of Wildlife Research, Texas A. & M. College (College Station), No. 894, 4 pp., 1 fig. (mimeographed), 1944.

Mainly on grazing in relation to turkeys. Overgrazing, damaging range vegetation, has a bad effect not only upon wildlife, but also upon the livestock industry itself. Effective regulation would improve the entire economy of the region. Baiting turkeys for shooting may result in too many birds being taken. To be on the safe side, the bag should be based upon trustworthy inventories.

Management: Turkey

Blakey, Harold L. Wild turkey vs. range management, Texas Game and Fish (Dalton Bldg., Austin. 10 cents a copy), 2(10), Sept. 1944, pp. 6-7, 14-15, 3 photos.

"The Edwards Plateau is one of the few places in the United States where the wild turkey contributes an economic profit of worthwhile proportions on land utilized for ranching and extensive agriculture. It is equally important to the landowner and the sportsman that the wild turkey, and the plants upon which it and other game species depend, be maintained at a proper level, inasmuch as this same vegetation makes excellent pasturage for livestock that produces the principal income on their lands." "Attempts by the ranchmen to find the proper rate of stocking resulted in various degrees of overstocking," which, if continued, will eliminate wildlife and decrease the profitableness

of grazing. Due to shortage of cover, predation is the most serious immediate factor limiting the turkey population. "Control of predatory animals may be helpful but is not an effective substitute for restoration of natural vegetation, which governs the carrying capacity of the range for both livestock and game animals." Competition with livestock is discussed and management suggestions are made.

Management: Upland game birds

Schrader, Thomas A. 'Huns' and bobwhites, Conservation Volunteer (Minnesota Dept. of Conservation, State Office Bldg., St. Paul), 7(42), Sept.-Oct. 1944, pp. 45-48, 2 figs.

The first successful plantings of the Hungarian partridge were made in the early 20's. These birds increased and spread, the State Department of Conservation stocked others on a large scale, and a peak population was attained in 1935. The next year there was a great reduction and there have been other fluctuations since. The bird and its habits and life history are succinctly described. "Damage to crops by Hungarians has never been reported in Minnesota." Food and cover requirements of the bird are well met in the State, but 66 percent of the nesting losses are due to human interference. The establishment of numerous small refuge areas might improve this situation. If roadsides and railroad right-of-ways were left unmowed, cover would be significantly increased.

As to the bobwhite, little can be done, Minnesota being on the northern fringe of its range. From one to thirteen thousand birds have been killed in various years, but the numbers of the birds vary greatly, being controlled mainly by the severity of the winters. Brief reference is made to the life history and habits of the bird. "Minnesota quail management should aim toward supplying more brushy areas that are suitable for cover. Discontinuing the practice of grazing in woodlots would contribute greatly to the welfare of this species. But when the severe weather comes, the quail will perish in the cold in spite of the best cover, and then it will be necessary to give complete protection while the few survivors of such a winter gradually build up a suitable population again."

Management: Waterfowl

Gabrielson, Ira N. Managing the waterfowl, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 15(5), Aug. 1944, pp. 3-5, 21, 5 photos, 2 maps.

Advantages and disadvantages of basing the hunting regulations on north and south flyway, instead of east and west flight-season, zones.

Management: Winter feeding, mule deer

Doman, Everett R., and D. I. Rasmusson. Supplemental winter feeding of mule deer in northern Utah, Journ. Wildlife Management (F. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(4), Oct. 1944, pp. 317-338, 2 pls., 2 figs., 6 tables.

From authors' summary: "(1) A review of records of supplemental winter feeding of deer in various states shows no method or diet that has proven entirely successful, although supplemental feeding sometimes has been publicized as a solution to prevent winter losses; (2) in northern Utah, large losses up to nearly 30 per cent of the population and primarily of fawns, 7 to 10 months of age, occurred even during average winters despite careful attempts to prevent such losses by feeding supplements; (3) heavy winter losses are not normal in mule deer, as evidenced by the few losses on areas where sufficient native forage is available to provide feed; (4) various supplements have been given to mule deer on the North Logan feed-ground, both singly and in combination. These include chopped and unchopped alfalfa, native grass hay, sweet clover hay, pea silage, barley (whole and rolled), oats, 'Purina' sheep pellets, cattle pellets, cottonseed cake, linseed meal, dry beet pulp and molasses, special prepared deer ration, and apple pomace. None of these appears to replace native forages successfully; (5) under usual feed-ground conditions, alfalfa seems to be as satisfactory for an emergency food as any available supplement on ranges where there is a fairly good supply of even the less palatable forage species, such as sagebrush and juniper. The feeding of alfalfa, however, will not prevent losses when the range is depleted so that deer must depend heavily on the alfalfa for two months or longer; (6) the time limit for successful supplemental feeding is about two months, as determined by repeated tests and study of weight losses in deer on a feed-ground. Weight losses in retrapped animals on the feed-ground is more serious in the younger animals, the average in four fawns during a 60-day period, in 1941-42 was 26.7 per cent. In 1942-43, 8 fawns lost 17.2 per cent of their January weights. For adults, the losses over a similar period were not as great, 10.9 per cent in 1941-42 and 11.6 per cent in 1942-43 of the January weights. January weights were definitely less than the peak weights in autumn. Observations over several years make it doubtful that mule deer ordinarily will survive a winter loss greater than 30 per cent of their autumn weights; (7) pen feeding experiments with fawns showed that a diet solely of alfalfa hay was insufficient to maintain their weight, even for short periods; (8) diets of 60 per cent alfalfa and 40 per cent barley or 'Purina' pellets prevented weight losses in penned deer over a 67-day feeding period. Such a diet would cost well over $1.50 per animal for a 60-day period. This appears prohibitive in terms of present returns from hunting licenses and the necessity of maintaining several animals to provide for a sustained annual removal of one legal deer by hunting; (9) the more that deer became dependent on the supplemental feeds and less on native forage, the greater were the winter losses. So long as some native forage was available, the deer continued to browse upon it even with an abundant offering of supplements; (10) the entire policy of supplemental winter feeding for deer is considered impractical as a welfare program, and also from the standpoints of finance and range management. Artificial feeding serves to concentrate deer in small areas year after year where the animals do serious and possibly irreparable damage to native forage species; in turn, this further reduces the carrying capacity of the range and makes the deer increasingly dependent on supplements."

Deaths in late winter and early spring were due to malnutrition, not to hard weather or disease. Various parasites were present; these are listed. Several management suggestions are made. Bibliography of 11 titles.

Natural History: Birds of Alaska

Cahalane, Victor H. Birds of the Katmai Region, Alaska, Auk, (J. Fletcher Street, 1130 Locust St., Philadelphia, Pa. $1.00 a copy), 61(3), July 1944, pp. 351-375.

Description of the region and of its life zones and ecological associations. Annotated list of species.

Natural History: Birds of Canada

Snyder, L. L. Canadian birds, Canadian Nature Magazine (177 Jarvis St., Toronto, Canada. 35 cents a copy), 32 pp., 15 pls., 1944.

A collection of papers presenting brief accounts of 5 birds from each of 15 habitats with pen-and-ink illustrations of each of them by T. M. Shortt.

Natural History: Birds of Canada

Soper, J. Dewey. The birds of Wood Buffalo Park and vicinity, northern Alberta and District of Mackenzie, N.W.T., Canada, Trans. Royal Canadian Inst. (198 College St., Toronto, Canada. $2.00 a copy), 24(1), Oct. 1942, pp. 19-97, pls. 2-3.

Account of the regional ecology and annotated list of 217 species of birds.

Natural History: Birds of Nebraska

Mohler, Levi L. Distribution of upland game birds in Nebraska, Nebraska Bird Review (F. M. Haecker, 506 South 52nd St., Omaha 6, Nebr. 50 cents a copy), 12(1), Jan.-June 1944, pp. 1-6, 2 maps.

Results from a questionary as to the distribution and abundance in Nebraska of the: eastern bobwhite, greater prairie chicken, prairie sharp-tailed grouse, European partridge, chukar partridge, and sage grouse.

Natural History: Florida

Goin, Coleman J. The lower vertebrate fauna of the water hyacinth community in northern Florida, Proc. Fla. Acad. Sci. (Dr. R. E. Bellamy, Sec'y., State College for Women, Tallahassee), 8, 1943, pp. 143-153, 1 pl.

Notes on the plant and the food resources for vertebrates of the communities it forms. Annotated list of the fishes, amphibians, and reptiles of the association. Bibliography of 7 titles. [As the plant is introduced, adaptation to it is recent; the light this throws on the precision of former and present adaptations is illuminating.]

Natural History: Mackenzie district

Clarke, C. H. D. Notes on the status and distribution of certain mammals and birds in the Mackenzie River and western Arctic area in 1942 and 1943, Canadian Field-Naturalist (I. L. Conners, Central Experimental Farm, Ottawa, Canada. 40 cents a copy), 58(3), May-June 1944, pp. 97-103.

General discussion of factors affecting wildlife in the region and comment upon the status of numerous species. With varying degrees of protection, the barren ground bears, marten, beaver, and musk ox seem assured of preservation. Referring to the woodland caribou, the author says, "No other species stands in such immediate danger of extinction in the Mackenzie District." The paper includes information on the relative numbers of cyclic species. Bibliography of 10 titles.

Natural History: Manatee

Gunter, Gordon. Texas manatees, Texas Game and Fish (Texas Game, Fish, and Oyster Commission, Austin. 10 cents a copy), 2(9), Aug. 1944, pp. 9, 11, 1 fig.

Popular account, chiefly relating to the appearance and distribution of this animal.

Natural History: Venomous snakes

Pope, Clifford H. The poisonous snakes of the New World, New York Zoological Society (New York 60, N. Y. 50 cents a copy), 47 pp., 42 figs. (2 col.), 1944.

General discussion of the characters, habits, and habitats of the groups of poisonous snakes. Brief accounts of species with special comment on range, according to major geographical regions of the Western Hemisphere. There is a section on snake-bite and its treatment. Bibliography. An informative publication with excellent illustrations.

Natural History: Wild rice

Moyle, John B. Wild rice in Minnesota, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 177-184.

Appearance and ecology, harvesting and value, variability, crop fluctuations and failures, yield, and propagation are discussed. About half a million pounds selling for from $100,000 to $400,000 is the average annual harvest in Minnesota. Utilization of the grain by wildlife is briefly treated. Bibliography of 9 titles.

Natural History: Wolves

Young, Stanley P., and E. A. Goldman. The wolves of North America, American Wildlife Institute (822 Investment Bldg., Washington, D. C. $6.00 a copy), xx+636 pp., 131 pls. (6 col.), 10 maps, tables, 1944.

Part I devoted to history, life habits, economic status, and control of wolves, is by Young, who wove into it the results of the field experience of himself and other members of the Biological Survey in addition to gleanings from the extensive literature on wolves, which is cited in an 80-page bibliography. Goldman's part on the classification of wolves is technically thorough and illustrated by tables of cranial measurements and photographs of the skull (in 3 positions) of a typical specimen of each of the subspecies recognized. The work comes close to being a literal monograph of North American wolves; it not only has lasting reference value but is interestingly presented and amply illustrated.

Natural History: Woodland grouse of Minnesota

Schrader, Thomas A. Ruffed and spruce grouse, Conservation Volunteer (Minnesota Dept. of Conservation, State Office Bldg., St. Paul), 7(41), July-Aug. 1944, pp. 36-40, 1 fig., 1 table.

The calculated kill of ruffed grouse is tabulated for years in which there was an open season, 1920 to 1943. Information on fluctuations in population and in kill is discussed in text and visualized in a graph. The life history of the bird and its cycles are discussed, the paper containing good reference material for any general student of cycles. The spruce grouse after becoming nearly extinct in the State has made some gains and it is hoped that sportsmen will refrain from shooting this overconfiding bird.

Predation: Upon fishes

Gentry, Glenn. Some predators of the Flintville State Fish Hatchery, Journ. Tennessee Acad. Sci. (Jesse M. Shaver, George Peabody College, Nashville, Tenn. 50 cents a copy), 19(3), July 1944, pp. 265-267.

Notes on the stomach contents of kingfishers, green herons, pied-billed grebes, one killdeer, water snakes, and pickerel frogs. Comment on the relation of predators to fish parasites. "Although it has been found advisable to destroy predators at fish hatchery ponds, it is not considered to be a good policy to destroy them on streams and lakes. Several investigations have shown that most of these predators are helpful instead of harmful to the fish populations of these kinds of waters." [The screening of fish ponds should be practiced wherever possible so that killing of predators will not be necessary.] Bibliography of 6 titles.

Propagation: Feeding bobwhites

Nestler, Ralph B., Woodrow W. Bailey, Leonard M. Llewellyn, and M. J. Rensberger. Winter protein requirements of bobwhite quail, Journ. Wildlife Management (J. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 218-222, 5 tables.

Authors' summary and conclusions: "Three experiments involving 714 bobwhite quail were conducted at the Patuxent Research Refuge, Bowie, Maryland, during the winters of 1939-1941 to determine the protein requirement of quail maintained through the winter. Considering survival, live weights, feed consumption, and subsequent reproduction by the birds, the 9 to 13 per cent levels of crude dietary protein gave as good results as higher levels and in some respects were better. On the basis of these studies, it is recommended that the winter maintenance diet for bobwhite quail contain about 11 to 12 per cent of crude protein." A formula for an adequate mash is presented.

Propagation: Feeding bobwhites

Nestler, Ralph B., Woodrow W. Bailey, W. J. Rensberger, and W. Y. Berner. Protein requirements of breeding bobwhite quail, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(4), Oct. 1944, pp. 284-289, 3 tables.

Authors' summary: "From 1939-42 four experiments were conducted at the Patuxent Research Refuge, Bowie, Maryland with breeding bobwhite quail to determine the optimum level of crude protein intake for maintenance and reproduction. In the first two experiments, each with 48 pairs of quail, protein levels of 15, 15, 17, 19, 21, and 23 per cent, respectively, were compared. In the last two, with 96 pairs of quail each, protein levels of 19, 21, 23, 25, 27, and 29 per cent were compared. The differences in survival of breeders at various protein levels, and the fertility and hatchability of their eggs, were not statistically significant. There were indications, however, that for optimum hatch, the protein should not be lower than 15 per cent. Maximum egg production was obtained with 23 per cent of crude protein. Production began earlier and continued longer with more birds on this level of protein than on any of the other eight levels. There was a tendency for the weight of the eggs to increase as the level of dietary protein was raised from 13 to 23 per cent. The consumption of feed increased in direct proportion of increase in the crude protein content of the diet. For both males and females, protein levels of 19 to 25 per cent were satisfactory for maintenance of body weight."

Propagation: Feeding bobwhites

Nestler, Ralph B., Woodrow W. Bailey, and Wm. D. Williams. Comparison of five major cereals in the maintenance diet of bobwhite quail, Game Breeder and Sportsman (1819 Broadway, New York, N. Y. 25 cents a copy), 49(3), March 1944, pp. 26-27, 1 fig., tables 1-4; 49(4), April 1944, pp. 46-47, tables 5-9.

Authors' summary: "Two experiments, involving 518 propagated bobwhite quail were conducted at Patuxent Research Refuge, Bowie, Maryland, during the winters of 1940-1942 to determine the comparative feeding values of corn, wheat, oats, barley, rye, and a combination thereof in a maintenance diet for winter use. Only when corn kernels were cracked into three to five pieces could they be eaten successfully. White corn was accepted as readily as yellow corn after the birds became accustomed to it. Corn, whether cracked or ground, was the favorite grain, and wheat the second choice. Oats, barley, and rye were partaken of very sparingly when corn and wheat were available. The lowest feed consumption was on the diet containing corn as the sole grain. Mortality on the diets containing either corn or barley was significantly lower than that on any of the other diets. The quail gained in weight on all of the diets. 'Picking' occurred to some degree on all the diets except that based on corn alone. The most severe outbreak was on the oat diet. Ground rye as the sole cereal in the maintenance diet caused severe caking of beaks. Replacement of 30 parts of rye in the diet with an equal quantity of corn checked the trouble. Likewise caking did not occur when the whole rye kernels were fed in conjunction with mash containing rye. Birds on the diet containing ground oats alone suffered severely from cold in marked contrast to quail using other cereals. Quail fed whole oats endeavored to hull the grain before consuming it. On the basis of mortality maintenance of live weight, feed consumption when no choice existed, and preference in instances where choice was possible, the feeding value of the cereals for the bobwhite quail, with corn rated as 100 was as follows:

Corn	100
Wheat	77
Mixture of cereals (in mash or as 'cafeteria')	76
Barley	75
Rye	72
Oats	67 "

Propagation: Feeding bobwhites

Nestler, Ralph B., Leonard Llewellyn, and Merrill Benner. Wartime diet for growing bobwhite quail, Journ. Wildlife Management (F. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 211-218, 4 figs., tables.

The most satisfactory diet tried in pre-war times, when any desired ingredients could be obtained, is described in formula and text. Wartime shortages made animal protein foods difficult to get, hence experiments were performed to find substitutes. The results are presented in detail and summarized. Bibliography of 9 titles.

Research: Age determination

Petrides, George A. How to tell their age, Field and Stream (515 Madison Ave., New York 22, N. Y. 25 cents a copy), 49(7), Nov. 1944, pp. 27, 79, 4 photos.

Summary of information on the distinguishing characteristics of young gallinaceous game birds.

Research: Age determination of pheasants

Kimball, James W. Age gauge for pheasants, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 263-264, 1 fig.

For measurement of the length of the spurs. Report of the studies upon which the suggestion is based. The method may require modification in other localities; this work done in Nebraska.

Research: Holding device for rats

Enlen, John T., Jr. Device for holding live wild rats, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 8(3), July 1944, pp. 264-265, 1 fig.

Description and illustration of the device which permits safe handling of rats. It could be adapted to fit various small mammals.

Research: Marking mice

Eddy, Gaines M., and C. R. Joyce. Notes on ear-tagging of mice, Journ. Mammalogy (Ernest T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 25(2), May 1944, pp. 199-200.

Description of a method deemed satisfactory.

Research: Tagging muskrats

Errington, Paul L. Additional studies on tagged young muskrats, Journ. Wildlife Management (P. F. English, 203 Forestry Bldg., State College, Pa. $1.00 a copy), 8(4), Oct. 1944, pp. 300-306, 1 pl., 1 table.

Author's summary: "Since the results of preliminary work in back-tagging of 463 young (mainly suckling) muskrats in Iowa were published in 1937, 214 additional individuals marked similarly; of the latter, 17 were again handled or heard of after intervals sufficient to give valuable data. Sixty-five other young muskrats were toe-clipped, making a total of 742 marked by all methods from 1935 to 1943. Due to the severity of drought emergencies, only one toe-clipped specimen was later recovered. In view of the known evidence, the back-tagging method appears, under natural Iowa conditions, to be highly effective when used exclusively for the marking of muskrats in the second to fourth weeks of life, the ages when often obtainable in large numbers from marsh lodges. This method, however (tried without success by Takos in Maine on mixed age classes, living in polluted waters), is not recommended for marking muskrats more than four weeks of age." Bibliography of 9 titles.

Weights

Becker, George E., and Joseph M. Stack. Weights and temperatures of some Michigan birds, Bird-Banding (Charles B. Floyd, 210 South St., Boston, Mass. 75 cents a copy), 15(2), April 1944, pp. 45-68, tables.

Review of literature (17 titles cited) of both subjects, giving the principal findings. Description of the methods used in this study, presentation of the results, and comparison with those obtained by other students. There is a brief general discussion and the following general conclusions: "(1) There is a decided variation in bird weights and temperatures; (2) there is a slight indication that larger birds have a lower average body temperature than the smaller species; (3) repeater weights average lower and their temperatures average higher than the average sample of the whole species; (4) the Slate-colored Junco and the White-throated Sparrow show a gain in weight in the spring from the preceding fall; (5) there is no seasonal effect on temperature variation in the data."

WILDLIFE LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Fish and Wildlife Service, U. S. Department of the Interior, Chicago 54, Ill.

246. Save meat--it is valuable, by D. Irvin Rasmussen, 5 pp., October 1943.

Suggestions as to the treatment of game carcasses in the field and in storage, and directions for the curing of wild meat. A table shows the amount of usable flesh obtainable from deer of various weights.

252. Local control of magpies through destroying nests and roosts and through trapping, by E. R. Kalmbach, 4 pp., 1 fig., April 1944.

Summary of the economic status of the magpie and suggestions as to control through destruction of eggs and young, dispersal of roosts, and trapping.

253. Annual fur catch of the United States, 21 pp., July 1944.

Reports of varying degrees of completeness on the take by species (or other groups) in recent years in Alaska, the Pribilof Islands, and the States. The total catch exceeds 20 million animals and the raw fur value is around 100 million dollars.

254. Control of vagrant domestic pigeons, 4 pp., May 1944.

The origin and status of feral pigeons is discussed and suggestions are made for their control by elimination of harborage, the use of frightening devices, and by trapping, shooting, poisoning, and gassing.

256. Electric beacons used to frighten wild ducks from grainfields, by Ralph H. Imler, 4 pp., 1 pl., June 1944.

Description of the beacon and report on tests of it made in North Dakota and Colorado. The mechanism of the beacon is illustrated.

257. Facts about snakes, 10 pp., July 1944.

New edition of a leaflet of long standing. It treats: Some popular misconceptions, snake myths, general habits of snakes, hibernation, shedding skins, economic value of snakes, precautionary measures against snakes, suggestions for snake proofing a building, suggestions for eradicating undesirable snakes, use of poisonous gases, and other methods of eradication.

260. Eliminating bats from buildings, by James Silver, 4 pp., September 1944.

The characteristics, habits, and economic status of bats are briefly summarized and suggestions made as to bat-proofing buildings, the use of repellents, and destruction of the animals by fumigation.

NOTES AND NEWS

One of the first technically-educated foresters in the United States, Captain I. F. Eldredge retired from the Forest Service, U. S. Department of Agriculture, at New Orleans, La., on June 30. After almost 40 years of forestry experience from coast to coast, he leaves the staff of the Southern Forest Experiment Station which he has served as director of the forest survey of the Lower South since 1932. He will maintain his home in New Orleans.

Ross O. Stevens informs us that a 20 percent discount on the price ($3.50) of his book "Talk about Wildlife" (abstracted in *WILDLIFE REVIEW*, No. 40, June 1944, pp. 36-37) is allowed to libraries and to men and women in the armed services, if ordered through the North Carolina State College Wildlife Club, Box 5486, State College Station, Raleigh, N. C.

The title of a recent publication (1943) of the Imperial Bureau of Animal Breeding and Genetics fully indicates its contents. It is "Gestation Periods, a table and bibliography," compiled by J. W. Kenneth (Pp. 23. Edinburgh and London: Oliver and Boyd, 1943. 2s.). It contains a very long list of mammals with their common and scientific names, followed by the time in days of their gestation periods. The average time is given and also the minimum and maximum times where available. Where different times are given by different authorities, these are cited separately and all data are followed by references to the publications from which they are taken. In domestic mammals, separate times are given for the different breeds and in some instances for crosses between them. A number of workers will be grateful for this ready ac-

cess to a scattered literature. A wide range of variation is shown from the sixteen days of the golden hamster, Mesocricetus auratus, up to the 426 days of the okapi, Okapi johnstoni, and 641 days of the elephant, Elephas indicus. (Nature, Feb. 5, 1944.)

The Educational Inserts prepared for Nature Magazine (1214 Sixteenth St., N.W., Washington 6, D. C.), by E. Laurence Palmer, are available in separate form at 20 cents each or at lower rates in quantity. Among wildlife topics treated are: Some common reptiles; Upland game birds and waterfowl; Our disappearing fur bearers; and Some western birds. A list of these and other publications of the American Nature Association may be obtained from the address given.

The Outdoorsman's Cookbook (211 pp., illus.) by Arthur H. Carhart, recently published by The Macmillan Company, may be ordered through any book dealer or from an office of the Company (Boston 16, New York 11, Atlanta 3, Chicago 16, Dallas 1, or San Francisco 5).

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